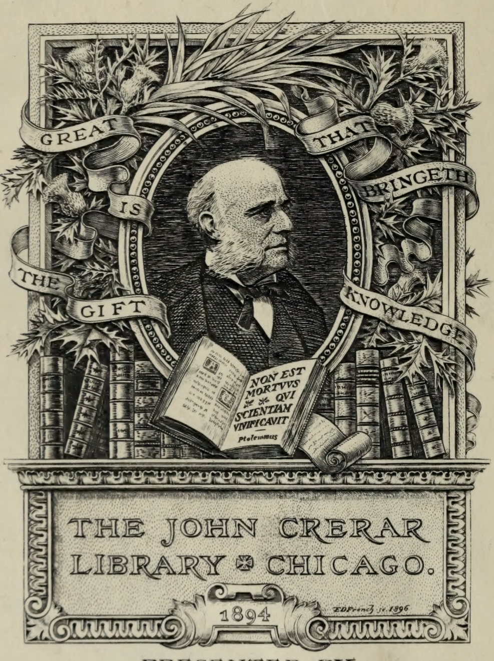

GREAT IS THE GIFT THAT BRINGETH KNOWLEDGE
NON EST MORTVVS QVI SCIENTIAM VIVIFICAVIT
Ptolemaeus
THE JOHN CRERAR LIBRARY CHICAGO.
1894
E.D.French sc.1896

PRESENTED BY

College.

Digitized by the Internet Archive
in 2013

http://archive.org/details/bulletinoflafaye1117lafa

Vol. 7, No. 2 February, 1913

BULLETIN

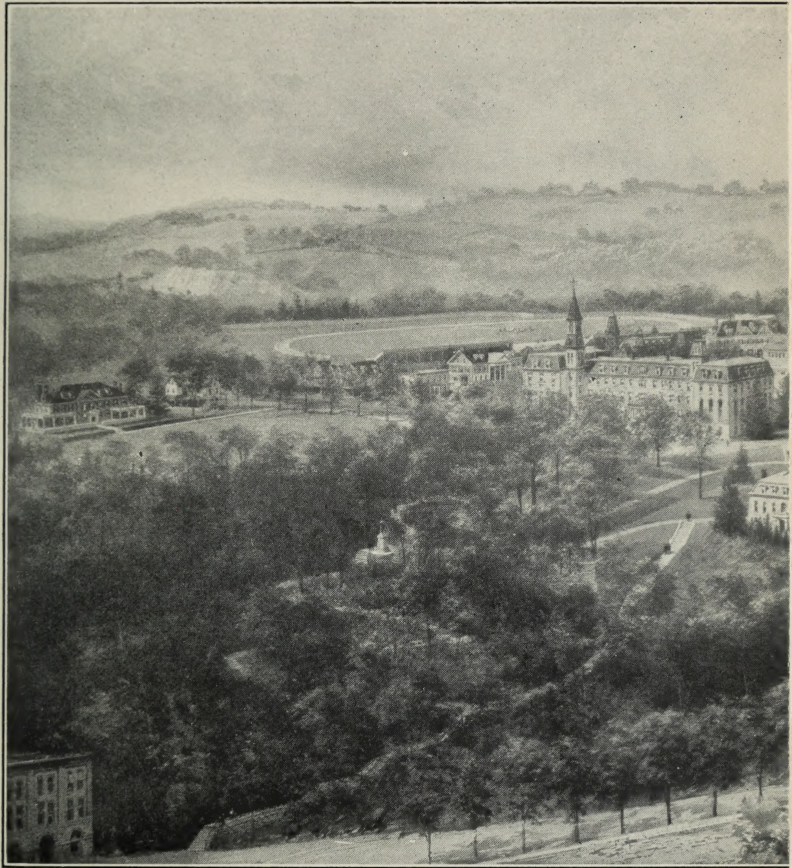
OF

LAFAYETTE COLLEGE

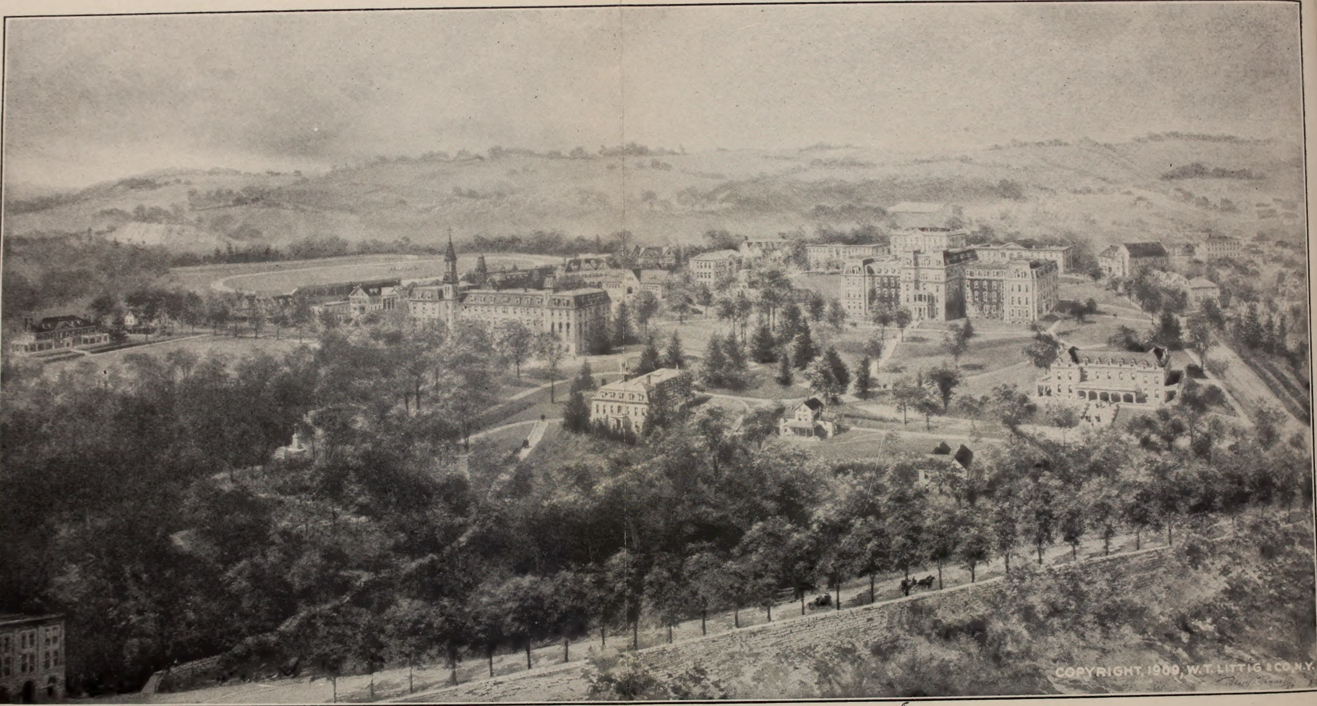
General Catalogue
1912-1913

Published Quarterly by Lafayette College

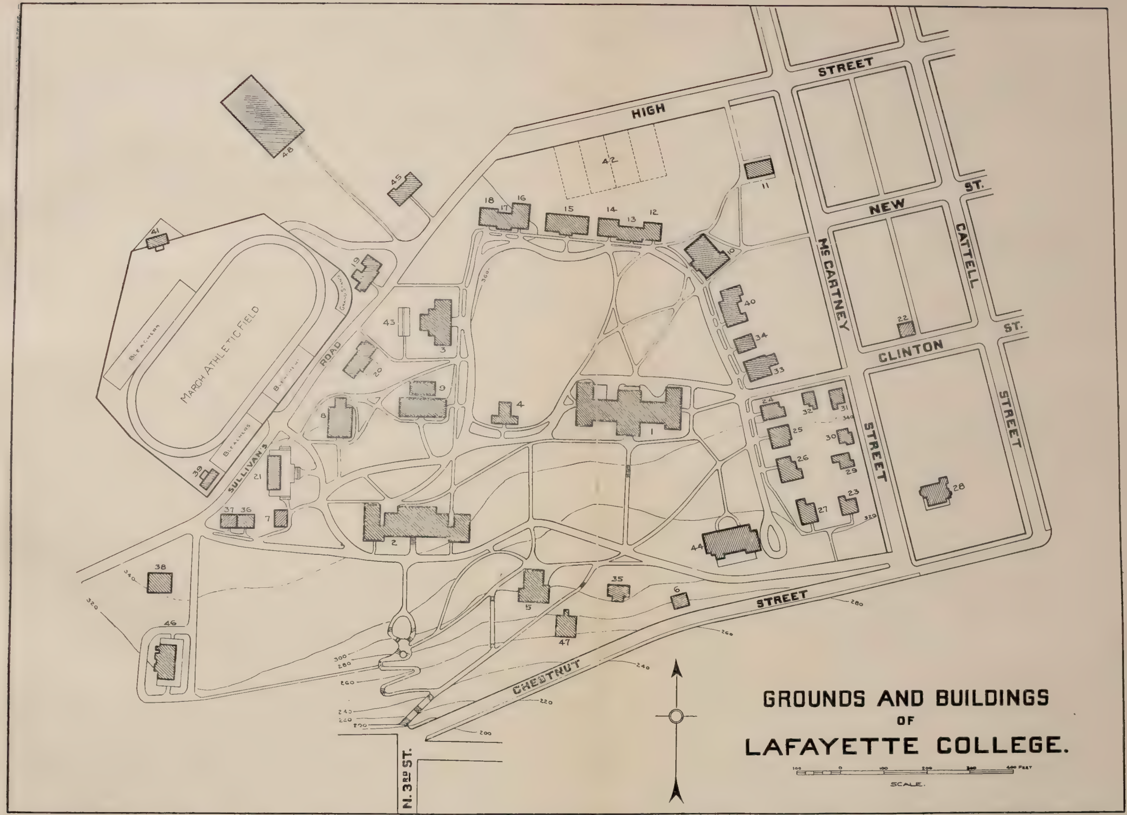
Entered as second-class matter November 20, 1906, at Easton, Pennsylvania,
under the Act of Congress of July 16, 1894.



LAFAYETTE COLLEG


COPYRIGHT, 1909, W. T. LITTIG & CO. N.Y.

LAFAYETTE COLLEGE, EASTON, PENNSYLVANIA.



GROUNDS AND BUILDINGS OF LAFAYETTE COLLEGE.

1 Pardee Hall.
2 South College.
3 Gayley Hall of Chemistry.
4 Observatory.
5 Jenks Biological Laboratory.
6 Private Laboratory.
7 College Office.
8 Gymnasium.
9 Van Wickle Library
10 Brainerd Hall.
11 East Hall.
12 Powell Hall.
13 Fayerweather Hall.
14 Martien Hall.
15 McKeen Hall.
16 Newkirk Hall.
17 Knox Hall.
18 Blair Hall.
19 Delta Kappa Epsilon.
20 Phi Delta Theta.
21 Theta Delta Chi.
22 Sigma Chi.
23 Prof. Davison.
24 Prof. Youngman.
25 Prof. Hardy.
26 Prof. Hall.
27 Prof. Lyle.
28 President Warfield.
29 Prof. Peck.
30 Prof. Owen.
31 Prof. Wysor.
32 Prof. Mecklin.
33 Prof. Coffin.
34 Prof. March, Jr.
35 Prof. Hart.
36 Prof. Raschen.
37 Prof. Rankin.
38—
39 Field House.
40 Delta Upsilon.
41 Field House.
42 Tennis Courts.
43 Greenhouse.
44 Zeta Psi.
45 Phi Kappa Psi.
46 Chi Phi.
47 Central Heating Plant.
48 Mechanical Eng. Bldg.

---

2 and 11 to 18—Dormitories.

BULLETIN OF
LAFAYETTE COLLEGE

INCLUDING THE COURSES OF STUDY

IN THE

CLASSICAL *and* SCIENTIFIC DEPARTMENTS

AND THE

DEPARTMENTS *of* CIVIL, MINING, ELECTRICAL, *and* MECHANICAL ENGINEERING *and of* CHEMISTRY

EIGHTY-FIRST YEAR
1912-1913

EASTON, PENNSYLVANIA
1913

VERITAS LIBERABIT.

CONTENTS.

Absences and Re-examinations 139
Admission 15
Advanced Standing 22
Alphabetical Subject Index 28
Alumni Association 176
Attendance 137
Bequests and Devises 166
Buildings 148
Calendar 6
Chemical Course 79
Civil Engineering Course 50
Classical Course 35
College Officers 14
Commencement 143
Course Numbers 25
Courses of Study 24
Degrees 144
Degrees Conferred 1912 171
Dormitories 152
Electrical Engineering Course 66
Expenses 161
Faculty 9
General Scientific Course 44
Graduation 143
Lafayette College 7
Latin Scientific Course 43
Libraries 155
Matriculation 23
Mechanical Engineering Course 72
Medical Treatment 145
Mining Engineering Course 59
Prizes 166
Prizes Awarded 1912 172
Religious Instruction 146
Societies 159
Students 179
Terms 148
Theses 175
Trustees 8
Vacations 148
Y. M. C. A. 154

378.748
L41

377180

1912

JULY

S	M	T	W	T	F	S
...	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	...	...	...
...	...	...	...	...	...	...

AUGUST

S	M	T	W	T	F	S
...	...	...	...	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
...	...	...	...	...	...	...

SEPTEMBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	...	...	...	...	...
...	...	...	...	...	...	...

OCTOBER

S	M	T	W	T	F	S
...	...	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	...	...
...	...	...	...	...	...	...

NOVEMBER

S	M	T	W	T	F	S
...	...	...	...	...	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
...	...	...	...	...	...	...

DECEMBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	...	...	...	...
...	...	...	...	...	...	...

1913

JANUARY

S	M	T	W	T	F	S
...	...	...	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	...
...	...	...	...	...	...	...

FEBRUARY

S	M	T	W	T	F	S
...	...	...	...	...	...	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	...
...	...	...	...	...	...	...

MARCH

S	M	T	W	T	F	S
...	...	...	...	...	...	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	...	...	...	...	...

APRIL

S	M	T	W	T	F	S
...	...	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	...	...	...
...	...	...	...	...	...	...

MAY

S	M	T	W	T	F	S
...	...	...	...	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
...	...	...	...	...	...	...

JUNE

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	...	...	...	...	...
...	...	...	...	...	...	...

JULY

S	M	T	W	T	F	S
...	...	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	...	...
...	...	...	...	...	...	...

AUGUST

S	M	T	W	T	F	S
...	...	...	...	...	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	...	...	...	...	...	...

SEPTEMBER

S	M	T	W	T	F	S
...	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	...	...	...	...
...	...	...	...	...	...	...

OCTOBER

S	M	T	W	T	F	S
...	...	...	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	...
...	...	...	...	...	...	...

NOVEMBER

S	M	T	W	T	F	S
...	...	...	...	...	...	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	...	...	...	...	...	...

DECEMBER

S	M	T	W	T	F	S
...	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	...	...	...
...	...	...	...	...	...	...

1914

JANUARY

S	M	T	W	T	F	S
...	...	...	...	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
...	...	...	...	...	...	...

FEBRUARY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
...	...	...	...	...	...	...
...	...	...	...	...	...	...

MARCH

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	...	...	...	...
...	...	...	...	...	...	...

APRIL

S	M	T	W	T	F	S
...	...	...	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	...	...
...	...	...	...	...	...	...

MAY

S	M	T	W	T	F	S
...	...	...	...	...	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	...	...	...	...	...	...

JUNE

S	M	T	W	T	F	S
...	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	...	...	...	...
...	...	...	...	...	...	...

CALENDAR.

1912.

September 19, Thursday	College year began.
October 16, Wednesday	Founders' Day.
November 28, Thursday	Thanksgiving Day.
December 21, Saturday	First term ended.

1913.

January 3, Friday	Second term began.
January 30, Thursday	Day of Prayer for Colleges.
March 19, Wednesday	Second term ends.
April 3, Thursday	Third term begins.
May 12, Monday	Junior Oratorical Contest.
May 22–28	Final Examinations of the Senior Class.
May 30, Friday	Memorial Day. Barge Oratorical Contest.
June 10–14	Examination of lower classes.
June 15, Sunday	Baccalaureate Sermon. Sermon before the Brainerd Society.
June 16, Monday	Senior Class Day and Concert.
June 17, Tuesday	Literary Societies and Class Reunions.
June 18, Wednesday	Commencement Exercises.
June 19, Thursday	Examinations for Admission.
September 15, Monday	Registration for entrance.
September 16–17	Examinations for admission.
September 18, Thursday	College year begins.
October 15, Wednesday	Founders' Day.
November 27, Thursday	Thanksgiving Day.
December 23, Tuesday	First term ends.

1914.

January 8, Thursday	Second term begins.
January 29, Thursday	Day of Prayer for Colleges.
March 25, Wednesday	Second term ends.

LAFAYETTE COLLEGE.

Lafayette College is situated at Easton, Pa., upon a site of remarkable beauty, overlooking the confluence of the Delaware and Lehigh rivers. It is thoroughly furnished with the buildings and apparatus to do the work of a progressive college and polytechnic school, and also with the equipment, so important in this age, for a healthful and wholesome student life. Its large and able faculty represent the best traditions of scholarship as well as the recent extensions of scientific knowledge and the newer methods of research. It frankly recognizes its obligation to give its students training, as well as the opportunities for acquiring knowledge, and to make its discipline include moral and spiritual culture. Recent revisions of the requirements for admission and of the courses of study have been made. It will be found that these changes meet the demands of the day for liberty of choice without sacrificing the supreme consideration of thoroughness.

Easton is a railroad center and easily accessible from all directions. It is about seventy-five miles from New York, seventy from Philadelphia, eighty from Scranton and one hundred from Wilkes-Barre and Harrisburg. The Lehigh Valley, Pennsylvania, N. J. Central, Phila. & Reading, D. L. & W., and L. & H. Railways afford convenient and rapid facilities for railway travel. It is also an important industrial center, and there are many advantages afforded the students in the Technical courses by its location. Its situation insures the most perfect conditions for the promotion of health.

TRUSTEES.

John Welles Hollenback, Esq	Wilkes-Barre, Pa.
Hon. William S. Kirkpatrick, LL.D	Easton, Pa.
Rev. Ethelbert D. Warfield, D.D., LL.D	Easton, Pa.
Isaac P. Hand, Esq	Wilkes-Barre, Pa.
James Gayley, M.E., Sc.D	New York City.
Robert Snodgrass, LL.D	Harrisburg, Pa.
Rev. D. J. Waller, Jr., Ph.D., D.D	Bloomsburg, Pa.
Israel P. Pardee, M.E	Hazleton, Pa.
Charles B. Adamson, M.S	Philadelphia, Pa.
J. Renwick Hogg, A.M	Philadelphia, Pa.
McCluney Radcliffe, M.D	Philadelphia, Pa.
Rev. Leighton W. Eckard, D.D	Philadelphia, Pa.
Edgar M. Green, M.D	Easton, Pa.
John Markle, M.E	Jeddo, Pa.
Joseph De Forest Junkin, Esq	Philadelphia, Pa.
Edward J. Fox, Esq	Easton, Pa.
David Bennett King, Esq	New York City.
Nathan Grier Moore, Esq	Chicago, Ill.
William E. Baker, C.E	New York City.
Horace P. Glover, Esq	Mifflinburg, Pa.
Rev. J. Balcom Shaw, D.D., LL.D	Chicago, Ill.
Rev. John B. Laird, D.D	Frankford, Pa.
Simon Cameron Long, C.E	Philadelphia, Pa.
John E. Fox, Esq	Harrisburg, Pa.
A. C. Overholt, B.S	Scottdale, Pa.
Wayne Dumont, Esq	Paterson, N. J.
Rev. Albert J. Weisley, D.D	Scranton, Pa.
Emery J. Kerrick, C.E	Germantown, Pa.
William A. May, A.M., C.E	Scranton, Pa.

John Welles Hollenback, *President*	Wilkes-Barre, Pa.
William S. Kirkpatrick, *Vice-President*	Easton, Pa.
Charles B. Green, *Secretary and Treasurer*	Easton, Pa.

MEETINGS OF THE TRUSTEES.

Thursday, February 13, 1913	WINTER MEETING.
Thursday, May 1, 1913	SPRING MEETING.
Monday, June 16, 1913	COMMENCEMENT WEEK.
Wednesday, October 15, 1913	FOUNDERS' DAY.

FACULTY.

REV. ETHELBERT D. WARFIELD, D.D., LL.D.,
President, Professor of History and Political Science.
(John I. Blair Foundation.)

REV. ROBERT BARBER YOUNGMAN, A.M., PH.D.,
Emeritus Professor of the Greek Language and Literature.

REV. SELDEN JENNINGS COFFIN, A.M., PH.D. Retired.
(James H. Coffin Professorship of Astronomy.)

JOSEPH JOHNSTON HARDY, A.M., PH.D.,
Professor of Mathematics and Astronomy.
(George Hollenback Professorship of Mathematics.)

WILLIAM BAXTER OWEN, A.M., PH.D., Litt.D.
Professor of the Latin Language and Literature.

EDWARD HART, PH.D.,
Dean of the Pardee Scientific Department, Professor of Analytical Chemistry.
(William Adamson Professorship of Analytical Chemistry.)

JAMES MADISON PORTER, C.E.,
Professor of Civil Engineering.

FRANCIS A. MARCH, JR., A.M., PH.D.,
Professor of the English Language.
(Francis A. March Professorship.)

WILLIAM SHAFER HALL, C.E., E.M., M.S.,
Professor of Technical Mathematics.

EDGAR MOORE GREEN, A.M., M.D.,
Consulting Physician in the Department of Physical Training.

ALVIN DAVISON, A.M., PH.D.,
Professor of Biology.
(Jesse Chamberlain Professorship of Botany.)

FREDERICK BURRITT PECK, PH.D.,
Professor of Mineralogy and Geology.

REV. JOHN MOFFAT MECKLIN, A.M., PH.D.,
Professor of Mental and Moral Philosophy.
(James Renwick Hogg Professorship.)

JOHN FREDERICK LOUIS RASCHEN, A.M., Litt.D.,
Professor of Modern Languages.

CLARENCE McCHEYNE GORDON, PH.D.,
Professor of Physics.

ALLAN ROBERTS, PH.B., M.S.,
Professor of History.

JAMES WADDELL TUPPER, PH.D.,
Professor of English Literature.

JAMES THERON ROOD, PH.D.,
Professor of Electrical Engineering.

WILLIAM THOMAS LYLE, C.E.,
Professor of Municipal Engineering.

EDWIN MOORE RANKIN, A.M., PH.D.,
Professor of Greek.

EDWIN OBERLIN FITCH, JR., M.S.,
Professor of Mechanical Engineering.

HENRY WYSOR, B.S.,
Assistant Professor of Analytical Chemistry and Metallurgy

JAMES BRYANT HOPKINS, A.M.,
Assistant Professor of Romance Languages.

OTHO MCCARROLL GRAVES, B.S. in C.E.,
Assistant Professor of Graphics.

WILLIAM BENJAMIN MARQUARD, E.M.,
Assistant Professor of Mining Engineering.
(George B. Markle Professorship.)

JAMES HENRY DELONG, B.S.,
Instructor in Chemistry.

*JOHN ROYDEN HESS, PH.B.,
Instructor in Chemistry.

REV. ROBERT ROBINSON, A.M.,
Instructor in Hebrew.

WILLIAM HUNTINGTON KIRKPATRICK, A.B.,
Instructor in Municipal Law.

RAYMOND HENRY LACEY, A.M.,
Instructor in Latin.

HAROLD ANSON BRUCE,
Director of Physical Training.

WILLIAM TRUMBOWER FOSTER, PH.B., M.S.,
Instructor in Biology.

D. ARTHUR HATCH, E.M.,
Instructor in Mathematics.

JOHN CAWLEY, B.S.,
Instructor in Mathematics.

---

*Absent on leave.

ELMER CLAYTON TAYLOR, B.S.,
Instructor in Chemistry.

JOHN HAWLEY LARNED, A.B.,
Instructor in Latin and Romance Languages.

MILTON BERRY DOUB, B.S. in C.E.,
Instructor in Graphics.

ARTHUR EDWIN BYE, B.S.,
Instructor in English.

SAMUEL WINDSOR ROUNDS,
Instructor in Pattern Making and Foundry.

REGINALD BANCROFT COOKE, A.M.,
Instructor in English.

A. HENRY FRETZ, PH.B., C.E.,
Instructor in Geology and Mineralogy.

HOWARD WILSON MOODY, A.B., PH.D.,
Instructor in Physics.

HARRY THOMAS SPENGLER, C.E.,
Instructor in Surveying and Railroad Engineering.

CECIL HEYWARD WILLIAMS, A.M.
Instructor in Modern Languages.

JACOB EDWARD BOETHIUS, A.M.,
Instructor in Modern Languages.

HUBERT EVELYN BRAY, A.B.,
Instructor in Mathematics.

JAMES HENRY ENGLISH, A.B.,
Instructor in French and Latin.

HAROLD JOHN LOCKWOOD, E.E.,
Instructor in Physics.

ATCHESON LAUGHLIN HENCH, A.B.,
Instructor in English.

HAROLD DUMONT BEATTY, PH.B.,
Instructor in English.

WILLIAM SHANNON LOHR, B.S. in C.E.,
Instructor in Civil Engineering.

WARREN SNEDEN HIGGINS, M.E.E.,
Instructor in Electrical Engineering.

CLIFFORD ELLIOTT WILLIAMS, B.S. in C.E.,
Instructor in Cement Engineering.

KENNETH CUSHING GRINSLADE, B.S. in Chem.,
Instructor in Chemistry.

SAMUEL KAY HASLAM,
Instructor in Machine Shop and Forge.

ARTHUR DODD SNYDER, A.B.,
Instructor in Mathematics.

COLLEGE OFFICERS.

WILLIAM S. HALL, C.E., E.M., M.S.,
Clerk.

WILLIAM T. LYLE, C.E.,
Inspector of Buildings.

REV. JOHN F. STONECIPHER, D.D.,
Librarian.

REV. MAURICE A. FILSON, A.M.,
Assistant in Library.

EDWARD HART, PH.D.,
Curator of Gayley Hall, and Librarian of the Henry W. Oliver Library.

CHARLES B. GREEN, E.M.,
Registrar and Treasurer.

ALBERT MOORE LANE, PH.B.,
Bursar.

DEANS.

College	Professor Roberts.
SENIOR CLASS	The President.
JUNIOR CLASS	Professors Peck and Mecklin.
SOPHOMORE CLASS	Professors Owen and Hall.
FRESHMAN CLASS	Professors Hardy, Raschen, Hopkins and Mr. Cawley.

LAFAYETTE COLLEGE.

ADMISSION.

Every applicant for admission to the College is expected to report at the College offices and register immediately on his arrival. Before registering he must submit to the Registrar a satisfactory certificate of moral character from some person known to the College authorities, and a diploma or certificate of graduation from the school which he last attended, or, if he be not a graduate, a statement that he leaves the school with the approval of its principal and is honorably dismissed to this College, with a statement of the studies which he has pursued and the course which he desires to pursue. His application having been approved he is admitted to the examinations. Examinations are regularly held on the day following the annual commencement day in June, and the days preceding the first day of the Autumn term in September, and also on the first day of the second and third terms.

It is expected that every applicant for admission shall have pursued a four-year course of study in a high school or college preparatory school and shall have successfully completed his course of study representing an equivalent of sixteen hours per week for the four years. The specific requirements for the various courses are not intended to entirely cover all of the secondary school work, especially in the Technical and General Scientific Courses, but only to represent such preparation as is indispensable to enable a student to carry on the studies which are to be pursued in those courses. It is expected that the certificate of study brought by each student will fully set forth the studies which he has pursued during his secondary school course.

Requirements for Admission to the Freshman Class.

CLASSICAL COURSE.

Candidates are examined in the following subjects:

Geography.
History (A), (B) and (C).
Mathematics (A).
English.
Latin.
Greek.

(For details of subjects see pages 17–21.)

LATIN SCIENTIFIC COURSE.

Candidates are examined in the following subjects:

Geography.
History (A), (B) and (C).
Mathematics (A).
Physics or Chemistry.
English.
Latin.
German (A) and (B) or French (A) and (B).

(Candidates for the Classical and Latin Scientific Course offering Mathematics (A) and (B) can take advanced courses in Mathematics.)

GENERAL SCIENTIFIC COURSE.

Candidates are examined in the following subjects:

Geography.
History (A), (B) and (C).
Mathematics (A).
Physics or Chemistry.
English.
German (A) and (B) or French (A) and (B).

and one of the following subjects: Mathematics (B); a Second Modern Language (A) and (B); Latin Grammar (4 books of Caesar and 2 orations of Cicero or an equivalent).

CIVIL, MINING, ELECTRICAL AND MECHANICAL ENGINEERING AND CHEMICAL COURSES.

Candidates are examined in the following subjects:

Geography (A).	Physics or Chemistry.
History (A), (B) and (C).	English.
Mathematics (A) and (B).	German (A) and (B) or French (A) and (B).

DETAILS OF REQUIREMENTS FOR ADMISSION.

GEOGRAPHY.—It is expected that every applicant shall have had a full course in Political Geography and at least an introductory course in Physical Geography. This requirement need not be met by the secondary school if it has been previously complied with. For the Scientific courses, however, the more advanced study of Physical Geography or Physiography is recommended, and the candidate will receive full credit for such study.

HISTORY.

(A) ANCIENT HISTORY.—A short introduction setting forth the history of the earliest civilizations with particular study of Greek and Roman History down to the fall of Rome. The following books are recommended: Myers' "Rome, Its Rise and Fall;" Morey's, Leighton's or Allen's Roman History and Morey's or Oman's Greek History.

(B) MEDIAEVAL AND MODERN HISTORY.—Beginning with the results of the great Germanic invasions of Western Europe and tracing the rise of Modern History through the French Revolution epoch. Courses A and B are intended to constitute a course in General History and to give the student a general view of the development of modern civilization and fit him to pursue college courses in history, science, and philosophy with an intelligent understanding of the development of modern life and thought.

(C) AMERICAN HISTORY AND CIVIL GOVERNMENT.—The study of American History may be pursued prior to the secondary school and work done in the grammar grades will be accepted where there is evidence that it has been well done, but it is recommended that it should be a part of the secondary school course. The books of Fiske, McMaster and Johnston are recommended.

(D) ENGLISH HISTORY.—A detailed study of the History of England will be accepted as a part of the secondary school preparation but it is not specially required for any of the regular courses of this College and will not be accepted as a substitute for A and B.

MATHEMATICS (A).—*Arithmetic:* Complete, including the Metric System.

Algebra: Fundamental principles. Factoring. Fractions. Simple Equations. Involution. Evolution. Exponents. Quadratic Equations. Simultaneous Quadratic Equations. Equations Solved as Quadratics. Properties of Quadratic Equations.

Geometry: Plane Geometry entire; as in Wentworth, Wells or Loomis.

MATHEMATICS (B).—*Solid Geometry.*

Algebra: Surds and Imaginaries. Simple Indeterminate Equations. Inequalities. Ratio. Proportions and Variations. Progressions.

Plane Trigonometry: Through the solution of right and oblique triangles (Hall and Funk's Trigonometry or an equivalent); candidates should bring their logarithmic tables to the examination.

PHYSICS.—The elementary principles (Millikan and Gale, Hall and Bergen; Carhart and Chute, Mann and Twiss or Hoadley).

CHEMISTRY.—Elements of Inorganic Chemistry.

ENGLISH. *Grammar.*—A general examination will be given without special reference to any particular text-book to test familiarity with paradigms and syntactical analysis, and the correct use of English idioms.

Franklin's Autobiography and Milton's Paradise Lost, Books I and II.

Prose Composition: The writing of a short essay will be required upon a subject drawn from the foregoing text-books. No candidate will be accepted in English whose work is notably deficient in point of spelling, punctuation, idioms, or division into paragraphs.

The English Requirements Recommended by the Association of Colleges and Preparatory Schools will be accepted in place of Franklin's and Milton's works.

Books to be read: 1913, 1914, 1915 (two to be selected from each group).

Group I. The *Old Testament*, comprising at least the chief narrative episodes in *Genesis*, *Exodus*, *Joshua*, *Judges*, *Samuel*, *Kings*, and *Daniel*, together with the books of *Ruth* and *Esther;* the *Odyssey*, with the omission, if desired, of Books I, II, III, IV, V, XV, XVI, XVII; the *Iliad*, with the omission, if desired, of Books XI, XIII, XIV, XV, XVII, XXI; Virgil's *Aeneid*. The *Odyssey*, *Iliad* and *Aeneid* should be read in English translations of recognized literary excellence.

For any unit of this group a unit from any other group may be substituted.

Group II. Shakespeare's *Merchant of Venice; Midsummer Night's Dream; As You Like It; Twelfth Night; Henry the Fifth; Julius Caesar.*

Group III. Defoe's *Robinson Crusoe*, Part I; Goldsmith's *The Vicar of Wakefield;* Scott's *Ivanhoe* or *Quentin Durward;* Hawthorne's *The House of the Seven Gables;* Dickens's *David Copperfield* or *A Tale of Two Cities;* Thackeray's *Henry Esmond;* Mrs. Gaskell's *Cranford;* George Eliot's *Silas Marner;* Stevenson's *Treasure Island.*

Group IV. Bunyan's *Pilgrim's Progress*, Part I; *The Sir Roger de Coverley Papers* in "The Spectator;" Franklin's *Autobiography* (condensed); Irving's *Sketch Book;* Macaulay's *Lord Clive* and *Warren Hastings;* Thackeray's *English Humorists;* selections from Lincoln, including at least the two *Inaugurals*, the *Speeches in Independence Hall* and *at Gettysburg*, the *Last Public Address*, and the *Letter to Horace Greeley*, along with a brief memoir or estimate; Parkman's *Oregon Trail;* either Thoreau's *Walden*, or Huxley's *Autobiography* and selections from *Lay Sermons*, including the addresses on *Improving Natural Knowledge*, *A Liberal Education*, and *A Piece of Chalk;* Stevenson's *An Inland Voyage* and *Travels with a Donkey.*

Group V. Palgrave's *Golden Treasury* (First Series), Books II and III, with especial attention to Dryden, Collins, Gray, Cowper, and Burns; Gray's *Elegy in a Country Churchyard* and Goldsmith's *The Deserted Village;* Coleridge's *The Ancient Mariner* and Lowell's *The Vision of Sir Launfal;* Scott's *The Lady of the Lake;* Byron's *Childe Harold*, Canto IV, and *The Prisoner of Chillon;* Palgrave's *Golden Treasury* (First Series), Book IV, with especial attention to Wordsworth, Keats and Shelley; Poe's *The Raven*, Longfellow's *The Courtship of Miles Standish*, and Whittier's *Snow-Bound;* Macaulay's *Lays of Ancient Rome* and Arnold's *Sohrab and Rustum;* Tennyson's *Gareth and Lynette*, *Lancelot and Elaine*, and *The Passing of Arthur;* Browning's *Cavalier Tunes*, *The Lost Leader*, *How They Brought the Good News from Ghent to Aix*, *Home Thoughts from Abroad*, *Home Thoughts from the Sea*, *Incident of the French Camp*, *Herve Riel*, *Pheidippides*, *My Last Duchess*, *Up at a Villa—Down in the City.*

LATIN.—*Grammar:* The Roman method of pronunciation is used.

Caesar: Commentaries, four books, for a portion of which an equivalent in Nepos, Cicero's De Senectute or De Amicitia will be received.

Cicero: Orations, seven.

Virgil: Aeneid, six books, *Bucolics.*

Prose Composition: Daniell's or equivalent.

GREEK.—*Grammar:* The applicant should have a thorough acquaintance with the declensions of nouns, pronouns and adjectives and the conjugation of verbs. Especial emphasis is laid upon a familiarity with the forms of words and the essential principles of syntax. Pronunciation of words, with their written accents, should not be disregarded.

Prose Composition: Short sentences, based upon the *Anabasis*, will be set for translation from English into Greek. These are designed to test the applicant's knowledge of the important rules of syntax. (Collar and Daniell, or equivalent.)

Xenophon: Anabasis, four books, or an equivalent in the *Cyropaedia*. The student must be prepared to defend his translations of the passages set for examination.

Homer: Iliad, three books, or *Odyssey*, three books.

GERMAN (A).—An accurate knowledge of the principles of grammar, especially the inflection of articles, adjectives, pronouns, and nouns, the conjugation of the weak and strong verbs, the uses of the model auxiliaries; the prepositions and their government; the elementary rules of syntax and work order; to be able to read at sight ordinary German prose. It is believed that this requisite facility can be acquired by reading not less than two hundred duodecimo pages of simple German.

GERMAN (B).—This includes a thorough knowledge of accidence, of the elements of word-formation, and of the principal uses of the prepositions and conjunctions. The candidate should be familiar with the essentials of German syntax, and must possess the ability to translate into German easy English prose; to translate at sight passages from standard classical authors. The reading of at least three hundred and fifty pages in addition to that required under German (A) will develop such ability. For examination no specific authors or works are designated. Each candidate is required to bring a statement from his teacher, mentioning text-books used and authors read, including the number of pages translated.

FRENCH (A).—This embraces a thorough knowledge of the rudiments of grammar, including the inflection of the regular and the more common irregular verbs; the inflection of nouns and adjectives for gender and number; the uses of articles and partitive constructions; the forms and positions of personal pronouns; the uses of the other pronouns. Candidates should be able to read at sight ordinary modern prose. It is believed that this ability is acquired by reading two hundred duodecimo pages from the works of at least three different authors.

FRENCH (B).—Candidates should show a thorough knowledge of accidence, and a familiarity with the essentials of French syntax, especially the uses of the tenses, modes, prepositions and conjunctions. They must be able to translate into French a connected passage of simple English, and to translate at sight standard French authors. This proficiency may be acquired by reading, in addition to that required under French (A), not less than four hundred pages of the works of various standard authors. For examination no special authors or works are designated. Applicants should present a statement from their teachers setting forth the text-books used and the number of pages translated.

PARTIAL OR SPECIAL COURSES.

In addition to the courses above specified, students may be admitted under exceptional circumstances to pursue courses of study of a special character not leading to a degree. Such students are required to undergo such preliminary examination as may be deemed necessary to ascertain their fitness to pursue the proposed course. The examination will cover at least the requirements of some one of the regular courses if the student comes to College from a preparatory school. The needs of men of maturity who have been engaged in active pursuits and wish to fit themselves for more advanced work will be granted special consideration when the Faculty deem it wise. When admitted they are subject to the same rules and regulations and the same examinations in the studies pursued as are other undergraduates. On completing their course they will receive, on application, certificates of proficiency in such studies as they have satisfactorily completed.

ADVANCED STANDING.

Candidates for advanced standing are examined not only in the preparatory studies, but also specially in the previous studies of the class they wish to enter, or their full equivalents. No certificate from a preparatory school will be accepted as a substitute for College work.

Students from another College bringing certificates of rank and honorable dismissal are permitted to recite on trial with corresponding rank in this College, until there is sufficient test of their qualification for admission to regular standing. They will, however, be examined in the earlier studies of the course they enter which are not included in the curriculum of the College from which they come, unless there are full equivalents.

No student, whether from another College or not, will be admitted to the Senior class as a candidate for a degree after the beginning of the second term.

CONDITIONS.

Students who fail to pass in a part of the subjects in which they are examined may be admitted upon the condition that they pass a satisfactory examination on such subjects before the end of the term next after that in which they enter. The number of such conditions with which a student is admitted to the College will be determined in each case by a vote of the Faculty.

When a student is admitted upon the condition that he make up one or more deficiencies in a special delinquent class arranged by the College for the benefit of such students he will be required to pay a fee for such course in addition to other College charges.

CERTIFICATES.

Certificates of the Examination Board of the Association of Colleges and Preparatory Schools of the Middle States and Maryland, of the Regents of the University of the State of New York and of certain approved preparatory schools are received in lieu of examination for entrance. Certificates, which will be accepted only from graduates of regularly prescribed preparatory courses, must be signed by the principal and certify only to work done during school hours. They should be filed with the Registrar before the entrance examination in June. Blank certificates will be furnished upon application. Whenever the certificate does not cover one or more of the requirements of admission or supply a satisfactory equivalent, an examination upon such subject or subjects will be required. Such certificates will not be received after one year from the completion of the period of study for which they are given unless an additional certificate of continued study accompany them.

MATRICULATION.

No student is considered a regular member of the College until after his matriculation, which takes place thirty days after his entrance. During the interval between his admission and matriculation he is, however, in all respects subject to the laws of the College.

DESCRIPTION OF COURSES.

Three courses of study are offered in the Academic department leading to appropriate degrees. These courses have been carefully arranged so as to provide a thorough mental discipline and prepare the student to pursue to advantage the learned professions or to meet the requirements of a business career. The Freshman and Sophomore years are prescribed. The Junior and Senior years are half prescribed and half elective. A very wide choice of studies is provided both by the threefold arrangement of courses and by the numerous electives of the last two years. At the same time continuity and thoroughness are secured by the requirement of a large part of the curriculum.

The Technical courses are prescribed throughout. They are arranged so as to provide in the earlier years a general education of the kind that is indispensable for the successful pursuit of the engineering and chemical professions; and in the later years a thorough professional training.

Every student is expected to arrange a schedule of at least sixteen weekly exercises. These exercises are calculated on the basis of *periods*—the period being the equivalent of one recitation hour or three hours of drawing room, laboratory, or field work. A lecture which does not require previous preparation may be combined with two hours of practical work in a *period*.

The following courses of study are offered:

CLASSICAL COURSE.
Leading to the degree of A.B.

LATIN SCIENTIFIC COURSE.
Leading to the degree of Ph.B.

GENERAL SCIENTIFIC COURSE.
Leading to the Degree of B.S.

CIVIL ENGINEERING COURSE.
Leading to the Degree of C.E.

MINING ENGINEERING COURSE.
Leading to the Degree of E.M.

ELECTRICAL ENGINEERING COURSE.
Leading to the Degree of E.E.

MECHANICAL ENGINEERING COURSE.
Leading to the Degree of M.E.

CHEMICAL COURSE.
Leading to the Degree of B.S. in Chemistry.

COURSE NUMBERS.

For description of courses see pages 85–136.

LANGUAGE AND LITERATURE.

1– 50	ENGLISH.
51– 70	ELOCUTION.
71–160	GERMAN AND ROMANCE LANGUAGES.
161–200	CLASSICS.
201–210	HEBREW.

HISTORY, POLITICAL SCIENCE, AND PHILOSOPHY.

221–250	BIBLE.
251–310	PHILOSOPHY.
311–350	HISTORY.
351–400	POLITICAL AND SOCIAL SCIENCE.

Science and Mathematics.

401–440	Mathematics.
441–460	Graphics.
461–490	Physics.
491–530	Geology.
531–550	Astronomy.
551–580	Biology and Hygiene.

Civil Engineering.

601–610	Surveying.
611–620	Railroads.
621–630	Mechanics.
631–640	Roads and Pavements.
641–650	Masonry.
651–660	Cement and Concrete.
661–670	Hydraulics.
671–680	Sewerage.
681–689	Water Supply.
690–698	Roofs and Bridges.
699–700	Theses.

Mining Engineering.

701–705	Mine Surveying.
706–710	Mine Exploration.
711–715	Deep Boring.
716–720	Drilling, Blasting, and Air Compression.
721–725	Shaft Sinking and Drifting.
726–730	Mine Exploitation.
731–735	Mine Haulage and Hoisting.
736–740	Mine Ventilation and Lighting.
741–745	Mine Drainage.
746–750	Mine Construction.
751–755	Ore Dressing.
756–760	Mining Law.
761–765	Mine Machinery.
766–770	Mine Administration.
771–775	Theses.

ELECTRICAL ENGINEERING.

801–810	GENERAL DIRECT CURRENT ENGINEERING.
811–820	GENERAL ALTERNATING CURRENT ENGINEERING.
821–830	ELECTRICAL LABORATORY.
831–840	ENGINEERING ABSTRACTS.
841–850	ELECTRICAL DESIGN.
851–860	ELECTRICAL POWER UTILIZATION.
861–870	ELECTRIC POWER TRANSMISSION.
871–880	ELECTRIC POWER GENERATION.
881–890	ELECTRICAL COMMUNICATION.
891–900	THESES.

CHEMISTRY.

901–950	CHEMISTRY.
951–960	METALLURGY.
961–970	TECHNICAL GERMAN.
971–980	THESES.

MECHANICAL ENGINEERING.

1001–1010	SHOP WORK.
1011–1020	DESIGN.
1021–1030	STEAM ENGINEERING.
1031–1040	MECHANICAL ENGINEERING LABORATORY.
1041–1050	GAS ENGINEERING.
1051–1060	HEATING AND VENTILATING.
1061–1070	INDUSTRIAL MANAGEMENT.
1071–1080	ABSTRACTS—THESES.

ALPHABETICAL SUBJECT INDEX.

Numbers immediately following the subject refer to the courses of study, pages 85–136.

Numbers in parenthesis indicate the year and term in which the subject is given.

Page.

Agricultural Chemistry........973 (IV, 2) 133
Algebra........401–5 (I, 1–3) 105
Alternating Current Engineering.... 811–14 (III, 1–2; IV, 1) 127
American History........331–4 (I, 1–3; III, 2) 104
Analytical Geometry........416–20 (I, 3; II, 1–2) 106
Anatomy, Mammalian........551 (III, 1) 115
Ancient History........311 (I–III) 103
Anglo-Saxon........10 (II, 2) 86
  11–13 (IV, 1–3) 86
Assaying........955 (IV, 2) 132
Astronomy
  Descriptive........531 (IV, 1) 113
  536 (IV, 1) 114
  Practical........541–2 (IV, 2–3) 114
Bacteriology and Hygiene........554 (IV, 1) 116
Bench Work........1004 (II, 3) 134
Bible
  English........221–3 (I, 1–3) 99
  French........224–6 (II, 1–3) 99
  German........233–5 (III, 1–3) 100
  Greek........227–9 (II, 1–3) 99
  236–8 (III, 1–3) 100
  Latin........230–2 (II, 1–3) 99
  239–41 (III, 1–3) 100
  History of........244 (IV, 3) 100
Biology
  General........553 (III, 3) 115
  Sanitary........561 (III, 3) 116
Blackstone........371–2 (IV, 2–3) 105
Botany........571 (III, 1) 117
Bridge Design........695–6 (IV, 2–3) 124
Bridge Erection........697 (IV, 3) 124
Calculus........426–7 (II, 1–2) 107
  429–31 (III, 1–3) 107

Cement....................................651 (III, 1) 121
Chemical Arithmetic...........................917 (II, 3) 131
Chemical Engineering...........................934 (IV, 1) 132
Chemical Technology..........................935 (IV, 2) 132
Chemistry
  Inorganic............................901 (II, 3) 130
    911–12 (I, 1–2) 130
  Organic..........................920–2 (III, 1–3) 131
  Theoretical...........................919 (III, 1) 131
    924–5 (III, 2–3) 131
  Thesis Work..................971–2 (IV, 2–3) 132
Church History..........................242–3 (IV, 1–2) 100
Comparative Philology..........................30–1 (IV, 3) 88
Concrete................................652–53 (III, 2–3) 121
Constitutional History, General............361–3 (IV, 1–3) 105
  United States..351–3 (III, 3; IV, 2–3) 104
Crystallography..............................493 (III, 3) 112
  495 (IV, 2) 112
  511 (III, 1) 112
Descriptive Geometry...........................451 (II, 1–3) 109
Differential Equations...........................432 (IV, 1) 108
  437 (II, 3) 108
Drawing...................................441 (I, 1–3) 108
Electrical Design...........................841–2 (IV, 1–2) 129
Electrical Laboratory...............821–4 (III, 1–3; IV, 1) 128
  825–8 (III, 2–3; IV, 2–3) 128
Electrical Power Stations.........................871 (IV, 2) 130
Electrical Power Transmission..................861 (IV, 1) 129
Electric Railroad..............................853 (IV, 3) 129
Elocution.....................................51–2 (I, 2–3) 88
  53–5 (II, 1–3) 88
  56–8 (III, 1–3) 88
  59–61 (IV, 1–3) 89
Embryology and Histology....................556 (IV, 3) 116
Engineering Abstracts...............831 (III, 1–3; IV, 1–3) 129
English Composition and Rhetoric..............1–3 (I, 1–3) 86
English Composition and Literature.............4 (II, 1–3) 86
English History.........................321–2 (III, 1–2) 103

English Language	Bacon	19 (III, 1)	87
	Bunyan	16 (II, 1)	87
	Chaucer	18 (II, 2)	87
	Dickens	22 (IV, 1)	87
	Drama	23–4 (IV, 2–3)	88
	Fiction	22 (IV, 1)	87
		23–4 (IV, 2–3)	88
	Longfellow	21 (III, 3)	87
	Milton	20 (III, 2)	87
English Language	Sentence Construction	15 (II, 1–3)	86
	Shakespeare	19–21 (III, 1–3)	87
	Spenser	17 (II, 2)	87
	Trench	14 (II, 1)	86
English Literature	16th and 17th Century	41–2 (III, IV, 1–2)	88
	18th Century	43 (III, IV, 3)	88
	Romantic Poets	44 (III, IV, 1)	88
	Later 19th Century Poets	45–6 (III, IV, 2–3)	88
Ethics		281 (IV, 1)	101
Eugenics		556 (IV, 3)	116
Forging		1003 (II, 2)	133
Foundry		1002 (II, 2)	133
French		111–2 (I, 2–3)	92
		115 (I, 1)	92
		126–8 (II, 1–3)	92
French Literature		129–31 (III, 1–3)	92
		132–4 (IV, 1–3)	92
		135–6 (IV, 2–3)	93
Gas Engines		1041 (III, 3)	135
Geology	Dynamical	491 (III, 1)	112
	Economic	521 (IV, 2)	113
	Field	494 (IV, 1)	112
		496 (IV, 3)	112
		522 (IV, 3)	113
	General	516–17 (IV, 1–2)	113
	Mining	523–4 (IV, 1–2)	113
Geometry		406–7 (I, 1)	106

German		71 (I, 2)	89
		72 (I, 3)	89
		75 (I, 1)	89
		80–1 (II, 3; III, 1)	90
		82–3 (III, 2–3)	90
		84–6 (I, 1–3)	90
		87–9 (II, 1–3)	90
German Literature		90–2 (III, 1–3)	91
		93–5 (IV, 1–3)	91
		96–8 (IV, 1–3)	91
		99–101 (IV, 1–3)	91
Graphic Statics		698 (IV, 1)	124
Greek	Aeschines	167 (III and IV, 1)	96
	Aeschylus	169 (III and IV, 3)	96
	Aristophanes	170 (III and IV, 1)	96
	Attic Orators	165 (II, 2)	95
	Demosthenes	167 (III and IV, 1)	96
	Drama	166 (II, 3)	95
	Herodotus	162 (I, 2)	95
	Homer	163–4 (I, 3; II, 1)	95
Greek	Lyric Poets	172 (III and IV, 3)	96
	Lysias	161 (I, 1)	95
	Menander	170 (III and IV, 1)	96
	Plato	161 (I, 1)	95
	Sophocles	168 (III and IV, 2)	96
	Theocritus	172 (III and IV, 3)	96
	Thucydides	171 (III and IV, 2)	96
	Xenophon	161 (I, 1)	95
		179–80 (I, 1–3)	
Heating and Ventilating		1051 (IV, 3)	136
Hebrew		201–2 (IV, 2–3)	98
History of Education		301 (IV,1–3)	102
History of Philosophy		291 (IV, 1–3)	101
Hydraulics		661–2 (III, 3; IV, 1)	122
		663–4 (III, 3; IV, 1)	122
Hydro-Electric Engineering		872 (IV, 2)	130
Hygiene		580 (I, 1)	117
Illuminating Engineering		852 (III, 3)	129
Industrial Management		1061 (IV, 3)	136
International Law		376 (IV, 1)	105

Italian		151–2 (III, 2–3)	93
Latin	Cicero	184 (II, 1)	97
		186 (II, 3)	98
	Horace	182–3 (I, 2–3)	97
	Hymns	185 (II, 2)	98
	Juvenal	188 (III, 2)	98
	Letters	191 (IV, 2)	98
	Livy	181 (I, 1)	97
	Lucretius	190 (IV, 1)	98
	Tacitus	187 (III, 1)	98
		189 (III, 3)	98
	Tusculan Disputations	192 (IV, 3)	98
Lead Burning		974 (IV, 2)	133
Least Squares		436 (II, 3)	108
Lettering		442 (I, 1)	109
Logic		251 (III, 3)	100
Machine Design		1012 (IV, 1)	134
Machine Drawing		452 (II, 3)	110
Machine Shop		1004 (II, 3)	133
Masonry		641–2 (III, 3; IV, 1)	121
Mechanical Engineering Laboratory		1031 (III, 3; IV, 1–3)	135
Mechanics, Applied		621–2 (II, 3; III, 1)	120
Mechanics of Materials		623–4 (III, 1–2)	120
Mechanism		1011 (II, 1–3)	134
Mensuration		421 (I, 3)	107
Metallurgy		951–2 (III, 1–2)	132
		953–4 (IV, 1–2)	132
Mine Administration		761 (IV, 3)	126
Mine Construction		746–48 (IV, 1–3)	126
Mine Surveying		701 (III, 1)	124
Mineralogy		513 (III, 3)	112
		706 (III, 2)	124
Mining		711 (III, 3)	125
		716 (III, 3)	125
		721 (IV, 1)	125
		726 (IV, 1)	125
		736 (IV, 2)	125
		731 (IV, 2)	125
		741 (IV, 3)	126

Mining Law .... 766 (IV, 3) 126
Motor Engineering .... 851 (III, 3) 129
Mining Theses .... 771 (IV, 3) 127
Ore Dressing .... 751 (IV, 3) 126
Orthographic Projection .... 443 (I, 2–3) 109
Park Engineering .... 683 (IV, 2) 123
Petrography .... 512 (III, 2) 112
Philosophy .... 254 (III, 3) 101
291–3 (IV, 1–3) 101
Physical Culture .... 581 (I, 1–3) 117
Physics .... 461–3 (II, III, 1–3) 110
Physiology .... 555 (IV, 2) 116
Political Economy .... 381–2 (IV, 2–3) 105
Power Plant Design .... 1014 (IV, 3) 134
Psychology .... 252 (III, 1–2) 100
253 (IV, 1–3) 101
303 (IV, 1–3) 102
Qualitative Analysis .... 902–4 (III, IV, 1–3) 130
913–15 (I, 3; II, 1–2) 131
926–7 (I, 2–3) 131
Quantitative Analysis .... 905–7 (IV, 1–3) 130
916 (II, 3) 131
918 (III, 1) 131
928–30 (II, 1–3) 132
931–32 (III, 2–3) 132
933 (IV, 1) 132
Railroads .... 611–12 (II, 2–3) 119
614–5 (III, 1–2) 119
Repairing .... 1005 (III, 3) 134
Roads and Pavements .... 631 (III, 2) 121
Roof Design .... 694 (IV, 1) 124
Roofs and Bridges .... 691–3 (IV, 1–3) 123
Sewerage .... 671–2 (IV, 1–2) 122
Spanish .... 141–2 (III, 2–3) 93
Steam Engineering .... 1023 (III, 2–3) 135
Steam Engine Design .... 1013 (IV, 2) 134
Summer School .... 602 (I, 3) 119
613 (II, 3) 119

Surveying	601 (I, 3)	119
	603–4 (II, 1; III, 3)	119
Technical German	961–6 (III, 1–3; IV, 1–3)	132
Telephone	881 (IV, 3)	130
Theism	302 (IV, 1)	102
Theory of Functions	433–4 (IV, 2–3)	108
Thermodynamics	1024 (IV, 1)	135
Trigonometry	411–13 (I, 2–3; II, 1)	106
Water Supply	681–2 (IV, 2–3)	123
Wood Work and Pattern-Making	1001 (II, 1)	133
Zoology	552 (III, 2)	115

CLASSICAL COURSE.

The Classical Course, which leads to the Degree of Bachelor of Arts, consists of the historic course in the *Arts*, or *Humanities*, and retains the regular character of that course, which has so long been regarded as the foundation of a liberal education.

This course affords the best preparation for the professions of law, medicine, and theology. The intellectual training and the specific matters of instruction are particularly adapted to the needs of those who follow these professions. It is sometimes doubted whether it is so well adapted to the preparation for the study of medicine as some of the other courses, but the technical vocabularly of medicine is so largely drawn from the Greek, and the history of the medical profession is so closely associated with the development of science in and through the Classical languages as to make it eminently desirable that the cultivated physician should have a classical education. The course includes all the instruction in Physics, Chemistry and Biology which is required for the admission to the best medical schools. It is so well understood that a classical training is highly desirable for the lawyer and the minister that no reference need be made to these professions except to point out that this course offers the broadest and most liberal culture and that there is a marked reaction in the educational world toward its approved methods. The same is true of the education of the teacher and the journalist. Indeed, it is the broadest in its outlook and the most far-reaching in its foundations. The addition of a wide range of elective studies has made it a desirable preparation for the study of any profession whether literary or scientific.

The instruction embraces a systematic study of the Bible and the Evidences of Christianity throughout the course, of the Ancient and Modern Languages and their literatures, together with Comparative Philology; Pure and Applied Mathematics; Physics, Chemistry, and the Natural Sciences; Rhetoric and Elocution; Logic and Metaphysics; History and Political Science; and Mental and Moral Philosophy.

SYNOPSIS OF STUDIES.

CLASSICAL COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA 2 AND SOLID GEOMETRY 2†	4	402 & 406
OR		
SOLID GEOMETRY‡	4	407
GREEK	4	161
LATIN	4	181
ENGLISH	2	1
HYGIENE	1	580
THE BIBLE	1	221

Second Term.

ALGEBRA†	4	403
OR		
ALGEBRA‡	4	404
GREEK	4	162
LATIN	4	182
ENGLISH	2	2

* See pages 85–136.

† Entered with Mathematics B, Division A.

‡ Entered with Mathematics A, Division B.

	Periods per week.	Course number.*
ELOCUTION	1	51
THE BIBLE	1	222

Third Term.

	Periods per week.	Course number.*
TRIGONOMETRY†	4	412
OR		
ALGEBRA‡	4	405
GREEK	4	163
LATIN	4	183
ENGLISH	2	3
ELOCUTION	1	52
THE BIBLE	1	223

SOPHOMORE YEAR.

First Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY†	4	418
OR		
TRIGONOMETRY‡	4	413
GREEK	4	164
LATIN	4	184
ENGLISH	2	14
FRENCH	2	126
ELOCUTION	1	53
THE BIBLE	1	227
THEME	1	62

Second Term.

	Periods per week.	Course number.*
PLANE AND SOLID ANALYTICAL GEOMETRY†	4	419
OR		
PLANE ANALYTICAL GEOMETRY‡	4	420
GREEK	4	165
LATIN	4	185
ENGLISH	2	10
FRENCH	2	127

---

* See pages 85–136.

† Entered with Mathematics B, Division A.

‡ Entered with Mathematics A, Division B.

	Periods per week.	Course number.*
ELOCUTION	1	54
THE BIBLE	1	228
THEME	1	62
Third Term.		
PHYSICS	4	463
GREEK	4	166
LATIN	2	186
FRENCH	2	128
GERMAN	3	80
CHEMISTRY	2	901
ELOCUTION	1	55
THE BIBLE	1	229
THEME	1	62

JUNIOR YEAR.

First Term.

PHYSICS	4	461
GERMAN	3	81
ELOCUTION	1	56
THE BIBLE	1	236
THEME	1	62
ELECTIVES.		
MATHEMATICS	4	429
PHILOSOPHY	2	252
GREEK	4	167
GEOLOGY	2	491
ENGLISH A	4	19
CHEMISTRY	2	902
BIOLOGY	2	551
FRENCH	2	129
HISTORY	2	321
LATIN	2	187
BIOLOGY	2	571
ENGLISH B	4	41
HISTORY OF EDUCATION	2	301
Second Term.		
PHYSICS	4	462

---

* See pages 85–136.

	Periods per week.	Course number.*
PHILOSOPHY	3	252
ELOCUTION	1	57
THE BIBLE	1	237
THEME	1	62
ELECTIVES.		
ENGLISH A	4	20
MATHEMATICS	4	430
GEOLOGY	2	492
GREEK	4	168
GERMAN	2	82
HISTORY	2	322
CHEMISTRY	2	903
HISTORY	2	331
FRENCH	2	130
LATIN	2	188
BIOLOGY	4	552
ENGLISH B	4	42
SPANISH	2	141
ITALIAN	2	151
HISTORY OF EDUCATION	2	301
Third Term.		
HISTORY	4	351
PHILOSOPHY	2	254
ELOCUTION	1	58
THE BIBLE	1	238
THEME	1	62
ELECTIVES.		
ENGLISH A	4	21
MATHEMATICS	4	431
GEOLOGY	2	493
GREEK	4	169
GERMAN	2	83
PHYSICS	2	463–6–9
CHEMISTRY	2	904
BIOLOGY	4	553
FRENCH	2	131

* See pages 85–136.

	Periods per week.	Course number.*
LATIN	2	189
ENGLISH B	4	43
SPANISH	2	142
ITALIAN	2	152
HISTORY OF EDUCATION	2	301

SENIOR YEAR.

First Term.

	Periods per week.	Course number.*
ASTRONOMY	4	536
PHILOSOPHY	3	281
ELOCUTION	1	59
BIBLE	1	242
THEME	1	62

ELECTIVES.

	Periods per week.	Course number.*
ENGLISH A	4	22
HISTORY	2	361
PHILOSOPHY	2	252, 253, 291 301, 303
PHYSICS	2	464, 467
CHEMISTRY	2	905
INTERNATIONAL LAW	2	376
MATHEMATICS	2	432
GERMAN	2	90 or 93
BIOLOGY	4	554
ENGLISH B	4	44
GREEK	4	170
FRENCH	2	132
GEOLOGY	2	494
LATIN	2	190
ANGLO-SAXON (optional)	1	12

Second Term.

	Periods per week.	Course number.*
PHILOSOPHY	2	302
POLITICAL ECONOMY	2	381
ELOCUTION	1	60
BIBLE	1	243
THEME	1	62

*See pages 85–136.

	Periods per week.	Course number.*
ELECTIVES.		
HISTORY	2	352
MATHEMATICS	2	433
GERMAN	2	91 or 94
GEOLOGY	2	495
ENGLISH A	4	23
BIOLOGY	4	555
GREEK	4	171
FRENCH	2	133 or 135
LATIN	2	191
HEBREW	2	201
PHILOSOPHY	2	292, 301, 303
ENGLISH B	4	45
BLACKSTONE	2	371
BUSINESS LAW	2	372
PHYSICS	2	465, 470
CHEMISTRY	2	906
ASTRONOMY	2	541
HISTORY	2	362
ANGLO-SAXON (optional)	1	13
SPANISH	2	141
ITALIAN	2	151

Third Term.

POLITICAL ECONOMY	2	382
PHILOLOGY	3	30
ELOCUTION	1	61
BIBLE	1	244
THEME	1	62
ELECTIVES.		
HISTORY	2	353
MATHEMATICS	2	434
GERMAN	2	92 or 95
GEOLOGY	2	496
ENGLISH A	4	24
BIOLOGY	4	556

---

* See pages 85–136.

	Periods per week.	Course number.*
GREEK	4	172
FRENCH	2	134 or 136
LATIN	2	192
HEBREW	2	202
ENGLISH B	4	46
BLACKSTONE	2	372
PHYSICS	2	468, 469
CHEMISTRY	2	907
ASTRONOMY	2	542
HISTORY	2	363
PHILOSOPHY	2	293, 301, 303
ANGLO-SAXON (optional)	1	14
SPANISH	2	142
ITALIAN	2	152

* See pages 85–136.

PARDEE SCIENTIFIC DEPARTMENT.

This Department was organized in 1866, in accordance with the conditions of a gift from Ario Pardee, Esq., of Hazleton, Pa. The original organization has been, from time to time, greatly enlarged and extended largely through the continued munificence of the founder. There are at present two general courses of study, Latin Scientific and the General Scientific, and four technical courses.

LATIN SCIENTIFIC COURSE.

This course, which leads to the Degree of Bachelor of Philosophy, was designed to meet the wishes of those who desire to pursue a course of liberal study without Greek. It is the same as the Classical Course except that the time devoted to the study of Greek in that course is given to the study of modern languages; great importance is paid to the study of the English language under the special direction of Professor Francis A. March, Jr.

By a new arrangement, those students in the Latin Scientific Course who desire to do so may begin Greek in the Freshman year, substituting it in Freshman and Sophomore years for modern languages. Those who pursue the study of Greek under this arrangement for four years may qualify for the Bachelor of Arts degree.

SYNOPSIS OF STUDIES.

LATIN SCIENTIFIC COURSE.

The course of study is the same as the Classical Course except as follows:

FRESHMAN YEAR.

German 84–85–86 is substituted for Greek, four periods a week being given to this subject during the three terms.

SOPHOMORE YEAR.

The Bible is read in Latin 230–31–32 instead of Greek. English 16–17–18 and German 87–88–89 are substituted for Greek.

JUNIOR YEAR.

The Bible is read in Latin 230–40–41 instead of Greek. English History 321 is substituted for German 81. German 91–92 are substituted for 81–3.

(For schedule of studies of the Classical Course see pages 36–42.)

GENERAL SCIENTIFIC COURSE.

This course was originally arranged to meet the demand for a course substituting the modern languages for Latin and Greek, and offering greater opportunities for the study of the sciences than was formerly given in the Classical Course. The extension of the elective system has greatly modified the character of this course. It now is rather designed to meet the requirements of students who, in their preparatory course, have failed to take advantage of opportunities for the study of the classics, and who are seeking a general preparation for business careers or for other callings which do not seem to require an acquaintance with the classical languages and literatures. In order to meet the very different inclinations of students and to make a close articulation with a large number of preparatory schools, a greater latitude is allowed in the preparation for this course than for the other courses, and more consideration is given to individual choice in its earlier years.

Those students who offer advanced mathematics for admission are expected to pursue advanced courses in mathematics and drawing with the students of engineering courses. Those who enter with the same requirement in mathematics as the students of the Latin Scientific Course will pursue the mathematics of that course. Those who offer advanced mathematics will also be expected to pursue the course in chemistry of the engineering courses and to take options connected with the mathematical group throughout the Freshman year. Those who do not offer advanced mathematics will be permitted to choose at the outset of their course between a more distinctly mathematical and scientific course and one offering more extensive courses in modern languages and history. The choice once made will be binding throughout the first two years.

The degree awarded at the completion of this course is Bachelor of Science.

Frequent request is made by students entering this course to be allowed so to modify its requirements as to anticipate some of the courses, particularly those in physics and biology, and thus provide a two years' course on a special schedule. The ground for this request is generally the purpose to prepare for admission to a school of medicine. The arrangement of this course, and more particularly of the Latin Scientific Course, with the opportunities for the election of extensive courses in Biology, Chemistry, Physics, and German has been made after consultation with leading teachers of medicine, and with the view of preparing students for the best medical schools. The order in which the sciences are studied has been carefully considered. The degree of mental development has determined the period in which each study is taken up. The importance of the mental discipline and the equipment of the student for his future work has been met in the requirements in Mathematics, English, and Psychology. In all of these respects this course, like all the courses offered by the College, aims rather at thoroughness than quickness of preparation. It is intended to impress upon the student that success in any profession or calling can be attained only by thoroughgoing and liberal training.

SYNOPSIS OF STUDIES.

GENERAL SCIENTIFIC COURSE.

FRESHMAN YEAR.

First Term.

		Periods per week.	Course number.*
1.	ALGEBRA	4	401
	ENGLISH	2	1
	CHEMISTRY	4	911
	DRAWING AND LETTERING	2	441*a*, 442
	GERMAN	4	75
	OR		
	FRENCH	4	115
	HYGIENE	1	580
	THE BIBLE	1	221
2.	ALGEBRA AND SOLID GEOMETRY	4	402 & 406 or 407
	ENGLISH	2	1
	GERMAN	4	75
	FRENCH	4	115
	HISTORY	2	334
	HYGIENE	1	580
	THE BIBLE	1	221

Second Term.

1.	TRIGONOMETRY	5	411
	ENGLISH	2	2
	CHEMISTRY	2	926

---

* See pages 85-136.

	Periods per week.	Course number.*
German	4	71
or		
French	4	111
Drawing and Projection	2	441*b*, 443*a*
The Bible	1	222
2. Algebra	4	403
English	2	2
German	4	71
French	4	111
History	2	334
The Bible	1	222

Third Term.

	Periods per week.	Course number.*
1. Analytical Geometry and Mensuration	5	416 & 421
English	2	3
Chemistry	2	927
German	4	72
or		
French	4	112
Drawing and Projection	2	441*c*, 443*b*
The Bible	1	223
2. Trigonometry or Algebra	4	412 or 404
English	2	3
German	4	72
French	4	112
History	2	334
The Bible	1	223

Sophomore Year.

First Term.

	Periods per week.	Course number.*
Analytical Geometry 2 and Differential Calculus 3†	5	417 & 426
or Trigonometry or		413

---

* See pages 85–136.

† Entered with Mathematics B.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY‡	4	418
ENGLISH	2	14
ENGLISH	2	15
GERMAN	2	87
ENGLISH	2	16
CHEMISTRY.—Analytical Chemistry	2	92
HISTORY	2	312
THE BIBLE	1	224
ELOCUTION	1	53
THEME	1	62

Second Term.

CALCULUS†	5	427
OR		
ANALYTICAL GEOMETRY‡	4	419
ENGLISH	2	17
ENGLISH	2	15
CHEMISTRY	2	929
HISTORY	2	313
ANGLO-SAXON	2	10
THE BIBLE	1	225
GERMAN	2	88
ELOCUTION	1	54
THEME	1	62

Third Term.

PHYSICS	4	461
ENGLISH	4	18
ENGLISH	2	15
BIOLOGY	4	561
CHEMISTRY	2	930
HISTORY	2	313
THE BIBLE	1	226

* See pages 85–136.

† Entered with Mathematics B.

‡ Entered with Mathematics A.

	Periods per week.	Course number.*
GERMAN	2	89
ELOCUTION	1	55
THEME	1	62

JUNIOR YEAR.

First Term.

PHYSICS	4	462
HISTORY	2	321
ELOCUTION	2	56
THE BIBLE	1	233
ELOCUTION	1	56
THEME	1	62

ELECTIVES.

GEOLOGY	2	491
ENGLISH A	4	19
ENGLISH	2	41
CHEMISTRY	2	931
BIOLOGY	2	551
BIOLOGY	2	571
FRENCH	2	129
GERMAN	2	90–93–96
HISTORY OF EDUCATION	2	301
PHILOSOPHY	2	252

After the First Term, Junior year, the schedule of study for the General Scientific Course is the same as for the Classical Course, except that during the rest of the Junior year the Bible is read in German 234–35 instead of Greek; and German 91–2, 94–5 or 97–8 is substituted for 82–3. (For schedule of study of the Classical Course see pages 36–42.)

* See pages 85–136.

THE CIVIL ENGINEERING COURSE.

The course in Civil Engineering has been designed to develop the mental faculties of the student in those studies which form the foundation of all branches of Technology with additional training in the subjects classed as Civil Engineering. The course also includes such general subjects, essential to a liberal education, as are shown in the synopsis on pages 54–58.

The graduate is prepared for immediate usefulness in the field and office, and, after a moderate amount of professional experience, to fill positions of trust and importance, not only in his chosen profession, but in allied work in mining, mechanical, electrical and architectural engineering.

CIVIL ENGINEERING LABORATORIES AND EQUIPMENT.

The Department has a large equipment of instruments necessary for various branches of engineering field practice, including tapes, compasses, transits, levels, plane tables, barometers, standard base line tapes and pulling apparatus, sextants, solar attachments, chronometers, floats and current meters. A twelve-inch portable altazimuth instrument, reading to single seconds by micrometer microscopes, and provided with level for double zenith distances, is used for instruction in Geodesy and Practical Field Astronomy. A precision level of the latest design is employed in instruction in precise leveling. The astronomical observatory contains an equatorial

PARDEE HALL.

telescope, transit, clock, chronograph, meteorological instruments, etc.

For use in the lecture room there are numerous models of the various types of bridge and roof trusses; several complete sets of full-weight standard rolled sections; numerous full-weight sections of riveted joints, representing bridge and boiler work, hand and power riveting; wall charts; working drawings; photographs; slide rules; and lantern, with reflectoscope. The hydraulic lecture room is directly connected with the laboratory, and the equipment of the latter is used for demonstration purposes before the class.

The Department also has a full-weight pin-connected highway bridge of fifty-feet span and fourteen-feet roadway weighing twelve tons, together with all false work and tools necessary to erect the same.

The GENERAL TESTING LABORATORY contains one transverse machine of 400,000 pounds capacity for specimens up to twenty-five feet in length and four feet in width, one 200,000-pound, three 100,000-pound screw testing machines and one 60,000-pound hydraulic testing machine arranged for tension, compression and transverse testing; a 4,000-pound wire tester and a small machine for testing cord, twine, etc.; a 4,000-pound transverse machine for specimens up to sixteen feet, and a smaller transverse machine for specimens up to five feet, arranged with micrometers for measuring deflections, and extension meters for measuring fiber deformations. The laboratory also contains a torsion machine of 125,000 inch-pound capacity for specimens up to twenty feet in length and a 10,000 inch-pound torsion machine of the pendulum type for short specimens;

a number of elongation meters of different types, compressometers and smaller micrometers, hand tools, etc., and apparatus for calibrating machines. There are also a number of special apparatus for shearing, punching, bending, etc., tests.

The CEMENT LABORATORY contains three 1,000- and, two 2,000-pound machines for testing cement by tensile, compressive, and transverse stress, a machine for moulding briquettes under pressure, a power-driven Boehme Hammer, a ball mill, an automatic sieving apparatus, apparatus for accelerated tests, etc. It is further equipped with large immersion tanks with running water, cement bins, briquette racks, and the necessary moulds, sieves, scales, moist closets, specific gravity apparatus, etc. It also contains a number of slate-top mixing tables, each provided with a moist closet, scales and the necessary hand tools.

The CONCRETE LABORATORY contains a large mixing floor, an immersion tank and the necessary moulds for beams up to fifteen feet in length, moulds for compression specimens, a beam crane and trucks of two tons' capacity for the convenient handling of specimens, scales, sieves, measures and storage bins for stone, sand and cement.

The HYDRAULIC LABORATORY contains a vertical pressure tank eighteen feet in height and five feet in diameter, arranged for making experiments on the flow of water through orifices and nozzles under heads up to three hundred feet, and provided with a device by which the orifice plates can be removed while the tank is under pressure; other smaller tanks for use under low heads; a standpipe sixty feet high; two tanks, thirty feet long for weir experiments and measurements of quantity; a turbine; impulse wheels; a centrifugal pump run by electric motor and provided with electric measuring instruments and transmission dynamometer; rotary, disc and reciprocating water meters; a Venturimeter; a weighing tank; absolute and differential pressure gauges; and other appliances for the measuring of water used in experiments and for the testing of meters, motors, nozzles and fire hydrants; as well as arrangements for lecture-room illustrations. There is also connected with the laboratory a boiler plant and a one-million gallon Worthington duplex pump upon which tests are made.

THE ROAD MATERIAL LABORATORIES.—Section 1 contains a rattler for testing paving brick with the necessary oven, scales, immersion tanks, etc. Transverse tests of paving brick are made in the General Testing Laboratory.

Section 2 contains a Deval abrasion machine for testing road metal together with the necessary scales, sieves, etc.

Section 3 will contain apparatus for making tests on petroleums, malthas, tars and asphalts in accordance with the methods employed by the office of Public Roads at Washington.

The SHOP, which is in charge of a skilled mechanic, contains two lathes, a drill press, a planer, a milling machine, a grinder and other necessary appliances for preparation of test specimens, models and apparatus and for repair work.

The LIBRARY contains the best and latest books and periodicals upon engineering subjects, and the students are encouraged to make free use of the same.

SYNOPSIS OF STUDIES.

CIVIL ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA	4	401
CHEMISTRY	4	911
GERMAN†	4	75
OR		
FRENCH‡	4	115
ENGLISH	2	1
DRAWING AND LETTERING	2	441*a*–442
THE BIBLE	1	221
HYGIENE AND PHYSICAL CULTURE	1	580

Second Term.

TRIGONOMETRY	5	411
CHEMISTRY	2	926
GERMAN ‡	4	71
OR		
FRENCH†	4	111
ENGLISH	2	2
DRAWING AND PROJECTION	2	441*b*–443*a*
THE BIBLE	1	222

Third Term.

ANALYTICAL GEOMETRY	4	416
MENSURATION	1	421
CHEMISTRY	2	927
GERMAN‡	4	72
OR		
FRENCH†	4	112
ENGLISH	2	3
DRAWING AND PROJECTION	2	441*c*, 443*b*

---

* See pages 85–136.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
SURVEYING	2	601
THE BIBLE	1	223
SUMMER SCHOOL IN SURVEYING (in vacation) THREE WEEKS		602

SOPHOMORE YEAR.

First Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS	3	426
PHYSICS	4	461
ENGLISH	2	4
DESCRIPTIVE GEOMETRY	$2^1/_3$	451*a*
SURVEYING	2	603
SHOP WORK	2	1001
THE BIBLE	1	224
THEME	1	62

Second Term.

	Periods per week.	Course number.*
DIFFERENTIAL AND INTEGRAL CALCULUS	5	427
PHYSICS	4	462
ENGLISH	2	4
DESCRIPTIVE GEOMETRY	$2^1/_3$	451*b*
RAILROADS	2	611
SHOP WORK	2	1002–3
THE BIBLE	1	225
THEME	1	62

Third Term.

	Periods per week.	Course number.*
ENGLISH	2	4
PHYSICS	4	463
DESCRIPTIVE GEOMETRY	$2^1/_3$	451*c*
MACHINE DRAWING	$1^1/_3$	452
APPLIED MECHANICS	4	621
RAILROADS	2	612
SHOP WORK	2	1004
THE BIBLE	1	226
SUMMER SCHOOL IN SURVEYING (in vacation) THREE WEEKS		613
THEME	1	62

---

* See pages 85–136.

JUNIOR YEAR.

First Term.

	Periods per week.	Course number.*
METALLURGY	2	915
CRYSTALLOGRAPHY	2	511
APPLIED MECHANICS	4	622
RAILROADS	3	614
MECHANICS OF MATERIALS	4	623
GENERAL TESTING LABORATORY	2	625
CEMENT	2	651
CEMENT LABORATORY	2	654
ELEMENTS OF ELECTRICAL ENGINEERING	3	804
THE BIBLE	1	233
THEME	1	62
Second Term.		
STEAM ENGINEERING	3	1023
PETROGRAPHY	2	512
SPANISH (optional)	2	141
ITALIAN (optional)	2	151
MECHANICS OF MATERIALS	4	624
GENERAL TESTING LABORATORY	2	626
ELECTRICAL LABORATORY	2	827
CONCRETE, PLAIN	2	652
CONCRETE (PLAIN) LABORATORY	2	655
RAILROADS	2	615
ROADS AND PAVEMENTS	2	631
ROAD MATERIAL LABORATORY	1	632
MECHANICAL ENGINEERING LABORATORY	1	1031
THE BIBLE	1	234
THEME	1	62
Third Term.		
MINERALOGY (systematic)	3	513
SANITARY BIOLOGY	2	561
SPANISH (optional)	2	142
ITALIAN (optional)	2	152
CONCRETE, REINFORCED	2	653

---

* See pages 85–136.

	Periods per week.	Course number.*
CONCRETE (REINFORCED) LABORATORY	2	656
HIGHER SURVEYING	2	604
MASONRY	2	641
HYDRAULICS	3	661
HYDRAULIC LABORATORY	1	663
FRAMED STRUCTURES	2	690
ELECTRICAL LABORATORY	2	828
BIBLE	1	235
THEME	1	62

SENIOR YEAR.

First Term.

GENERAL GEOLOGY	2	516
DESCRIPTIVE ASTRONOMY	2	531
ROOFS AND BRIDGES	2	691
ROOF DESIGNS	1	694
GRAPHIC STATICS	1	698
HYDRAULICS	3	662
HYDRAULIC FIELD WORK	–	664
MASONRY DESIGN	2	642
SEWERAGE	2	671
BIBLE	1	242
THEME	1	62

Second Term.

POLITICAL ECONOMY	2	381
GENERAL GEOLOGY	2	517
ROOFS AND BRIDGES	6	692
BRIDGE DESIGN	2	695
SEWERAGE DESIGN	2	672
WATER SUPPLY	3	681
PARK ENGINEERING	1	683
BIBLE	1	243
THEME	1	62

Third Term.

ROOFS AND BRIDGES	5	693
BRIDGE DESIGN	5	696

---

* See pages 85–136.

	Periods per week.	Course number.*
BRIDGE ERECTION	(2 days)	697
WATER SUPPLY DESIGN	2	682
THESIS	2	699
BIBLE	1	244

* See pages 85–136.

THE MINING ENGINEERING COURSE.

The course leading to the degree of Engineer of Mines (E.M.) is intended to give a general education and to prepare men for positions of responsibility in mining, metallurgy and general engineering. The policy of the Mining Department is to give thorough training in the underlying principles of mathematics, physics, chemistry, mineralogy, geology, metallurgy, surveying, mining engineering, and some practical knowledge in mechanical, civil and electrical engineering. With this fundamental training the mining graduates can successfully carry on specialized work and be rapidly advanced to positions of responsibility.

The training in geology consists of the study of mineralogy, crystallography, petrography, general and economic geology, and the geology of ore deposits.

The course in chemistry consists of lectures, recitations and laboratory work in inorganic chemistry, qualitative, quantitative and metallurgical analysis, blowpiping and assaying.

The work in the chemical, physical, mineralogical and geological laboratories and the drafting rooms is of a high standard. Although much time is given to the practical training in the laboratories, yet the work in such laboratories is always subordinated to the fundamental and all important class room work.

The study of Mining proper consists of courses extending throughout the Junior and Senior years and includes: mine surveying and problems, prospecting, deep boring, blasting, quarrying, shaft-sinking, drifting, tunneling, methods of mining and timbering, haulage, winding, ventilation, drainage, mining laws, mine and mill construction, ore dressing, metallurgy, mine machinery and mine administration.

Lafayette College is situated within easy reach of the anthracite coal fields, and magnetic iron mines of Pennsylvania and New Jersey, the zinc and copper mines of New Jersey and extensive quarries of cement rock, slate, serpentine, limestone and sandstone; the Bethlehem Steel Works, and also rolling mills, iron foundries, the Ingersoll-Rand Co., which is one of the largest manufacturers of mine machinery in the world, are located near Easton, and thus the mining students have opportunities of inspecting and studying the practical mining and metallurgical methods.

EQUIPMENT.

The college library contains the important periodicals on mining, metallurgical and engineering, and the transactions of the various engineering societies. A special mining library containing all mining books of value has been created for the convenience of the mining students.

The class room work in mining is illustrated by a large number of lantern slides, wall diagrams, maps of mines, drawings of mine plant and machinery, models of headframes, shafts, square set timbering, rock drills, hammers, picks, blasting apparatus, wire rope, screens, safety lamps, collection of minerals, anemometers, compasses, clinometers, dipping needles, transits, levels, barometers, and all the necessary instruments and equipment in surveying and mapping.

The milling laboratory is a model concentrating plant that is fully equipped to crush, classify, separate and concentrate ores. The equipment consists of a Blake crusher, Cornish rolls, elevators, centrifugal pump, trommels, hydraulic classifiers, spitzkastens, a Wilfley shaking table, a slime table, New Century jigs, and a motor to supply power.

The mine gas analysis laboratory is well equipped to determine quantitatively the various mine gases by both titration and absorption methods.

The equipments of other departments available to the mining students are described in this catalogue as follows:

	Page.
GENERAL TESTING LABORATORY	51
HYDRAULIC LABORATORY	52
CHEMISTRY AND ASSAYING	80
ELECTRICAL ENGINEERING LABORATORY	67
MECHANICAL ENGINEERING LABORATORY	72

VACATION COURSES.

All students in the mining course are required to take the three weeks Summer school of surveying at end of Freshman year.

Two weeks in the Spring vacation of Junior and Senior years are spent in an actual mine survey, and in inspecting and studying the practical mining operations. Students are strongly advised to spend at least one Summer vacation during their course in actual work at the mines.

SYNOPSIS OF STUDIES.

MINING ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA	4	401
CHEMISTRY	4	911

* See pages 85–136.

	Periods per week.	Course number.*
German†	4	75
or		
French‡	4	115
English	2	1
Drawing and Lettering	2	441*a*–442
The Bible	1	221
Hygiene	1	580
Second Term.		
Trigonometry	5	411
Chemistry	2	926
German‡	4	71
or		
French†	4	111
English	2	2
Drawing and Projection	2	441*b*–443*a*
The Bible	1	222
Third Term.		
Analytical Geometry	4	416
Mensuration	1	421
Chemistry	2	927
German‡	4	72
or		
French†	4	112
English	2	3
Drawing and Projection	2	441*c*, 443*b*
Surveying	2	601
The Bible	1	223
Summer School in Surveying (in vacation) 3 Weeks	–	602
SOPHOMORE YEAR.		
First Term.		
Analytical Geometry	2	417

---

* See pages 85–136.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
DIFFERENTIAL AND INTEGRAL CALCULUS	3	426
CHEMISTRY	2	928
PHYSICS	4	461
SHOP WORK	2	1001
ENGLISH	2	4
DESCRIPTIVE GEOMETRY	$2^1/_3$	451*a*
THE BIBLE	1	241
THEME	1	62

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS	5	427
CHEMISTRY	2	929
PHYSICS	4	462
SHOP WORK	2	1002–3
ENGLISH	2	4
DESCRIPTIVE GEOMETRY	$2^1/_3$	451*b*
THE BIBLE	1	225
THEME	1	62

Third Term.

APPLIED MECHANICS	4	621
CHEMISTRY	2	930
PHYSICS	4	463
DESCRIPTIVE GEOMETRY	$2^1/_3$	451*c*
MACHINE DRAWING	$1^1/_3$	452
SHOP WORK	2	1004
ENGLISH	2	4
THE BIBLE	1	226
THEME	1	62–63

JUNIOR YEAR.

First Term.

APPLIED MECHANICS	4	622
MECHANICS OF MATERIALS	4	623
ELEMENTS OF ELECTRICAL ENGINEERING	3	804
METALLURGY	2	951
CRYSTALLOGRAPHY	2	511
MINE SURVEYING	2	701

---

* See pages 85–136.

	Periods per week.	Course number.*
BIBLE	1	233
THEME	1	62

Second Term.

	Periods per week.	Course number.*
METALLURGY	2	952
MECHANICS AND MATERIALS	4	624
STEAM ENGINEERING	3	1023
MECHANICAL ENGINEERING LABORATORY	1	1031
ELECTRICAL LABORATORY	2	827
PETROGRAPHY	2	512
MINE PROSPECTING	2	706
BIBLE	1	234
THEME	1	62
(Spring vacation mine survey trip).		
SPANISH OR ITALIAN (optional)	2	141–151

Third Term.

	Periods per week.	Course number.*
MINERALOGY	2	513
HYDRAULICS	3	661
RAILROADS	2	611
ELECTRICAL LABORATORY	2	828
DEEP BORING	1	711
DRILLING AND BLASTING	1	716
MASONRY	2	641
STEAM ENGINEERING	2	1023
BIBLE	1	235
THEME	1	62
SPANISH OR ITALIAN (optional)	2	142–152

SENIOR YEAR.

First Term.

	Periods per week.	Course number.*
GENERAL GEOLOGY	2	516
HYDRAULICS	3	662
MINE CONSTRUCTION	2	746
FIELD GEOLOGY	2	522
SHAFT SINKING AND DRIFTING	2	721
MINE EXPLOITATION	2	726

---

* See pages 85–136.

	Periods per week.	Course number.*
ASTRONOMY	2	531
BIBLE	1	242
THEME	1	62

Second Term.

	Periods per week.	Course number.*
GENERAL GEOLOGY	2	517
GEOLOGY OF ORE DEPOSITS	2	521
ASSAYING	2	955
MINE CONSTRUCTION	2	747
MINE VENTILATION	3	736
MINE MACHINERY	2	761
POLITICAL ECONOMY	2	381
BUSINESS LAW (optional)	2	371
SPANISH (optional)	2	141
ITALIAN (optional)	2	151
BIBLE	1	243
THEME. Spring vacation mine inspection trip.	1	62

Third Term.

	Periods per week.	Course number.*
PETROGRAPHY	2	525
GEOLOGY OF ORE DEPOSITS	2	522
MINE CONSTRUCTION	2	748
ORE DRESSING	4	751
MINE DRAINAGE	3	741
MINING LAW	2	756
MINE ADMINISTRATION	2	766
MINE HAULAGE AND HOISTING	3	731
BUSINESS LAW (optional)	2	372
SPANISH (optional)	2	142
ITALIAN (optional)	2	152
BIBLE	1	244
THESIS	2	771

---

* See pages 85–136.

THE ELECTRICAL ENGINEERING COURSE.

The object of the course in Electrical Engineering is to give thorough instruction in such branches of engineering, both general and electrical, as shall fit the graduate to successfully meet and solve the problems which come to him as practicing electrical engineer. To this end, stress is laid on the attainment of a broad engineering and scientific training rather than on the specialization along any particular line or lines of Electrical Engineering. The aim is to train neither specialists nor artisans, but to give such instruction as shall enable the engineer to build up from the foundation of his knowledge of basic principles such specialized knowledge or reasoning as may be required to successfully meet the problem arising for solution.

The Freshman and Sophomore years are devoted to general instructional and culture courses. Thorough training is given in Mathematics, and Physics is taken throughout the Sophomore year, additional hours in elementary electricity and magnetism being given to the students from the Department of Electrical Engineering, so that they may be especially prepared to take up successfully their particular line of training during the last two years of their course.

Beginning with the second term of the Sophomore year, the fundamental principles of Electrical Engineering are studied in the class room and worked out in the laboratory, the design room, and in problem work. The aim has been to so arrange these several lines that they shall be mutually supplemental and thus give the student a clear, general conception of the principles involved, their correlation and relative importance.

The plan is continued throughout the Senior year as well, attention now being paid to the direct application of the theories and principles thus arrived at, to the various phases of present-day commercial practice, consideration being given to the financial and commercial as well as the engineering side.

The graduate is in this way prepared to take up in an effective and intelligent manner any branch of electrical engineering requiring general or special electrical training.

ELECTRICAL ENGINEERING LABORATORIES AND EQUIPMENT.

The laboratories are large and well arranged. The main electrical laboratory is thirty by sixty feet in dimensions, and is fitted up with representative types of continuous and alternating current generators and motors, lamp-banks, water rheostats, brakes, etc.; and the necessary instruments are supplied for loading and testing generators and motors.

The laboratories are supplied from the Easton Power Company's station, with two-phase alternating current, at a frequency of sixty cycles. This current is available for testing purposes.

A fifty kilowatt motor-generator set has been installed for the purpose of supplying the laboratories with direct current. This set consists of a seventy-five horse power induction motor, directly connected to two twenty-five kilowatt, 120-volt direct current dynamos, the current from which is supplied to the laboratories by means of the three-wire system.

In case of need, direct current from the plant of the Easton Power Company is also available.

While designed primarily as a source of direct current, this motor-generator set is so installed as to be available at all times for experimental tests by the students.

A portion of the laboratories is fitted up for the more delicate tests required. This consists of two rooms, each being about twenty-two feet square, containing the necessary instruments for accurate testing, among which are a Leeds and Northup Potentiometer, a Thompson Quadrant Electrometer, D'Arsonval Galvanometers, Wheatstone Bridges, condensers, etc. Particular attention is paid to photometry of electric illuminants and specially fitted rooms have been provided for this work.

SYNOPSIS OF STUDIES.

ELECTRICAL ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA	4	401
CHEMISTRY	4	911
GERMAN†	4	75
OR		
FRENCH‡	4	115
ENGLISH	2	1
DRAWING AND LETTERING	2	441*a*–442
THE BIBLE	1	221
HYGIENE	1	580

Second Term.

TRIGONOMETRY	5	411
CHEMISTRY	2	926
GERMAN‡	4	71
OR		
FRENCH†	4	111

* See pages 85–136.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
ENGLISH	2	2
DRAWING AND PROJECTION	2	441*b*, 443*a*
THE BIBLE	1	222
Third Term.		
ANALYTICAL GEOMETRY	4	416
MENSURATION	1	421
CHEMISTRY	2	927
GERMAN‡	4	72
OR		
FRENCH†	4	112
ENGLISH	2	3
DRAWING AND PROJECTION	2	441*c*, 443*b*
SURVEYING	2	601
THE BIBLE	1	223
THEME	1	63
SOPHOMORE YEAR.		
First Term.		
ANALYTICAL GEOMETRY	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS	3	426
SHOP WORK	2	1001
ENGLISH	2	4
DESCRIPTIVE GEOMETRY	$2^{1}/_{3}$	451*a*
PHYSICS	6	461, 464
THE BIBLE	1	224
THEME	1	62
Second Term.		
DIFFERENTIAL AND INTEGRAL CALCULUS	5	427
SHOP WORK	2	1002–3
ENGLISH	2	4
PHYSICS	6	462, 465
DESCRIPTIVE GEOMETRY	$2^{1}/_{3}$	451*b*
THE BIBLE	1	225
THEME	1	62
Third Term.		
ENGLISH	2	4

* See pages 85–136.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
SHOP WORK	2	1004
PHYSICS	6	463, 466
DESCRIPTIVE GEOMETRY	$2^{1}/_{3}$	451*c*
MACHINE DRAWING	$1^{1}/_{3}$	452
APPLIED MECHANICS	4	621
THE BIBLE	1	226
THEME	2	62–63

JUNIOR YEAR.

First Term.

ELECTRIC PROBLEMS	2	806
ALTERNATING CURRENT ENGINEERING	4	811
ELECTRICAL LABORATORY	2	821
ENGINEERING ABSTRACTS	1	831
APPLIED MECHANICS	4	622
MECHANICS OF MATERIALS	4	623
SHOP WORK	2	1004
THE BIBLE	1	233
THEME	1	62

Second Term.

ALTERNATING CURRENTS	3	812
ELECTRICAL LABORATORY	2	822
ENGINEERING ABSTRACTS	1	831
ELECTRICAL PROBLEMS	2	807
MECHANICS OF MATERIALS	3	624
SHOP WORK	2	1004
STEAM ENGINEERING	3	1023
MECHANICAL ENGINEERING LABORATORY	1	1031
SPANISH (optional)	2	141
ITALIAN (optional)	2	151
THE BIBLE	1	234
THEME	1	62

Third Term.

DIFFERENTIAL EQUATIONS	3	437
HYDRAULICS	3	661
ILLUMINATING ENGINEERING	4	852
MOTOR ENGINEERING	4	851

---

* See pages 85–136.

	Periods per week.	Course number.*
Engineering Abstracts	1	831
Electrical Laboratory	2	823
Steam Engineering	2	1023
Shop Work	2	1005
Spanish (optional)	2	142
Italian (optional)	2	151
The Bible	1	235
Theme	1	62

Senior Year.

First Term.

Hydraulics	3	662
Electrical Power Transmission	4	861
Alternating Current Circuits	5	814
Electrical Laboratory	2	824
Engineering Abstracts	1	831
Electrical Design	2	841
Thermodynamics	3	1032
The Bible	1	242
Theme	1	62

Second Term.

Political Economy	2	381
Business Law	2	372
Electrical Laboratory	2	825
Electrical Power Stations	4	871
Hydro-Electric Engineering	3	872
Electrical Design	2	842
Engineering Abstracts	1	831
The Bible	1	243
Theme	1	62

Third Term.

The Telephone	5	881
Electrical Laboratory	2	826
Engineering Abstracts	1	831
Electrical Railway Engineering	5	853
Thesis	2	861
The Bible	1	244
Graduation Thesis.		

* See pages 85–136.

THE MECHANICAL ENGINEERING COURSE.

The course in Mechanical Engineering aims to equip the student to handle general engineering problems. Courses in class room, drawing room, shops and laboratories, aim to give the student practice in the work that engineers are called on to perform, to enable him to base his work on principles and not on empirical formulae, and to give him the theory and practice necessary to deal intelligently with other men.

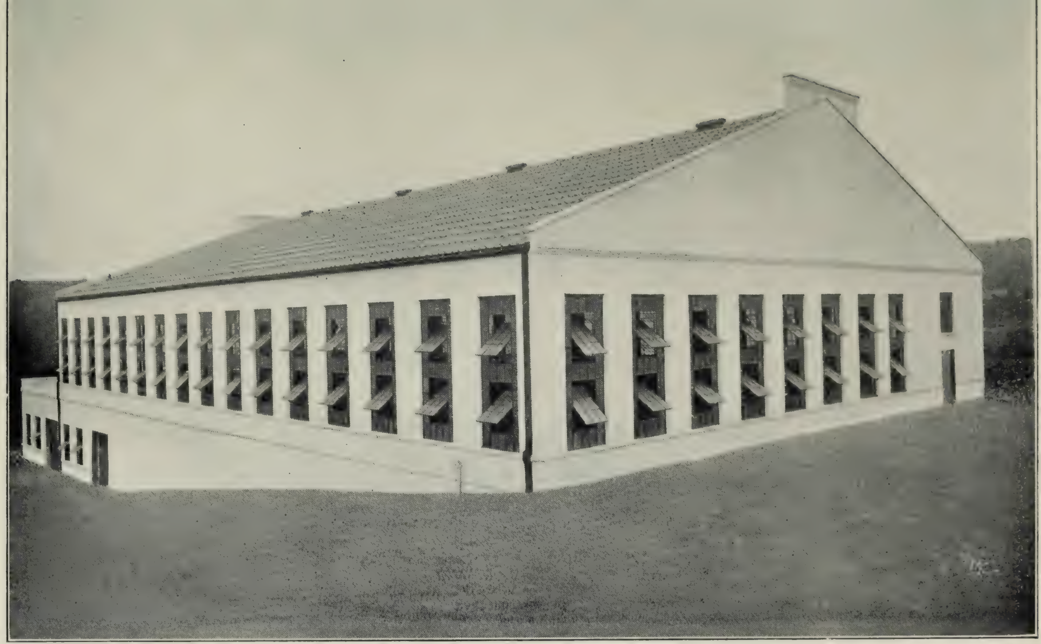
The recitation work of the Department begins with the study of Mechanism, and courses in valve gears, mechanisms of modern machine tools, boilers, steam engines, turbines, gas engines, thermo-dynamics, etc., are given in their turn. A course in machine design is given with the object of applying the principles already learned.

The work in the shops is given with the idea of teaching engineering principles and not manual training. Each student is required to keep the actual cost of every job assigned to him, a rate for his time being assumed.

The work in the Engineering Laboratory will be given with the object of drilling the student in the experimental work which the engineer is called on to perform, as boiler, pump, engine tests, etc.

MECHANICAL ENGINEERING LABORATORIES AND EQUIPMENT.

The new Shop and Steam Laboratory is 102 feet wide, 183 feet long, and 40 feet from floor to peak of roof, and is constructed entirely of concrete, steel, brick,



MECHANICAL ENGINEERING LABORATORY AND SHOP.

and glass, making a light airy building, absolutely fireproof. Two partitions 8 feet high extend down the center of the large room, forming a passage-way, to the left of which is the wood-working and machine shop, and to the right the steam laboratory and instructors' offices. At the back of these are the forge shop, the foundry, and the boiler room, connected with each of which is a storage room for the material to be used, and a coal bunker. A large toilet room, supplied with hot and cold water and fitted with individual lockers, is provided in the basement for the convenience of the students.

Each of the carpentry benches has a complete set of non-edged tools, and enough of the edged tools to assign a set to each man at the beginning of his course for his exclusive use throughout, and he is held responsible for their condition. This is an incentive for the student to keep his tools sharp, and is a great help in the production of good work. There are also wood-turning lathes, power saws, planers, etc.

The foundry is supplied with a cupola, a soft metal furnace, a core oven, ladles, flasks, and all tools necessary to make moulds and turn out practical castings in brass or iron. A large bull-ladle of a capacity equal to that of the cupola is kept under the tap-spout at all times, that in case there should be a break at the breast no molten iron can spatter upon the floor and endanger the men. A dry grinder is provided for roughing off the castings.

The forge shop is equipped with student forges, and a large instructor's forge, all of the down-draft type, anvils, and all of the tools used for the shaping and welding of metals by this process.

The machine shop is fully equipped with vise benches for hand work, lathes, planers, shapers, milling machines, drill presses, power saw, grinding machine, and all small tools to go with each of the machines. All are motor-driven, and direct-connected wherever possible, making a light shop, eliminating the danger of belts, and also furnishing a convenient means for testing any of the machines, or tools of various makes of steel, under different conditions of operation. The gears are encased to give greater safety to the operator.

The steam laboratory is to be equipped with standard types of steam engines installed to run condensing or non-condensing. Injectors, pumps, steam turbines, gas engines, and all instruments required for complete tests will be furnished. The boiler room will contain a fire tube and a water tube boiler, to furnish steam for the laboratory, and also to provide a convenient plant for instruction in firing, operating, and testing boilers.

All of the equipment is of full practical size of standard make, most modern design, and of a type that offers the greatest educational advantages. Every care has been taken to make all of the equipment as safe as possible for the inexperienced student. Certain machines are kept locked, and may be used only under the direct supervision of an instructor.

SYNOPSIS OF STUDIES.

MECHANICAL ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA	4	401

---

* See pages 85–136.

	Periods per week.	Course number.*
CHEMISTRY	4	911
GERMAN†	4	75
OR		
FRENCH‡	4	115
ENGLISH	2	1
DRAWING AND PROJECTION	2	441*a*–443
BIBLE	1	221
HYGIENE	1	580

Second Term.

TRIGONOMETRY	5	411
CHEMISTRY	2	926
GERMAN‡	4	76
OR		
FRENCH†	4	116
ENGLISH	2	2
DRAWING AND PROJECTION	2	441*b*–443*a*
BIBLE	1	222

Third Term.

ANALYTICAL GEOMETRY	4	416
MENSURATION	1	421
CHEMISTRY	2	927
GERMAN‡	4	71
OR		
FRENCH†	4	111
ENGLISH	2	3
DRAWING AND PROJECTION	2	441*c*–443*b*
SURVEYING	2	601
BIBLE	1	224
THEME	1	63

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY	2	417

---

* See pages 85–136.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
DIFFERENTIAL AND INTEGRAL CALCULUS	3	426
PHYSICS	4	461
ENGLISH	2	4
DESCRIPTIVE GEOMETRY	$2^1/_3$	451*a*
MECHANISM	2	1011
SHOP WORK	2	1001
BIBLE	1	224
THEME	1	62
Second Term.		
DIFFERENTIAL AND INTEGRAL CALCULUS	5	427
PHYSICS	4	462
ENGLISH	2	4
DESCRIPTIVE GEOMETRY	$2\ /_3$	451*b*
MECHANISM	2	1011
SHOP WORK	2	1002–3
BIBLE	1	225
THEME	1	62
Third Term.		
ENGLISH	2	4
PHYSICS	4	463
DESCRIPTIVE GEOMETRY	$2^1/_3$	451*c*
MACHINE DRAWING	$1^1/_3$	452
APPLIED MECHANICS	4	621
MECHANISM—VALVE GEARS	2	1011
SHOP WORK	2	1004
BIBLE	1	226
THEME	2	62–63
JUNIOR YEAR.		
First Term.		
APPLIED MECHANICS	4	622
MECHANICS OF MATERIALS	4	623
ELEMENTS OF ELECTRICAL ENGINEERING	3	804
BOILERS	2	1021

---

* See pages 85–136.

	Periods per week.	Course number.*
SHOP WORK	2	1004
METALLURGY	2	951
CRYSTALLOGRAPHY	2	511
BIBLE	1	233
THEME	1	62

Second Term.

MECHANICS OF MATERIALS	3	624
ELECTRICAL LABORATORY	2	827
BOILERS	2	1021
STEAM ENGINEERING	3	1023
SHOP WORK	2	1004
METALLURGY	2	952
PETROGRAPHY	2	512
SPANISH (optional)	2	141
ITALIAN (optional)	2	151
BIBLE	1	234
THEME	1	62

Third Term.

HYDRAULICS	3	661
FRAMED STRUCTURES	2	690
ELECTRICAL LABORATORY	2	828
GAS ENGINES	2	1041
STEAM ENGINEERING	2	1023
MECHANICAL ENGINEERING LABORATORY	2	1031
SHOP WORK	2	1004-5
SPANISH (optional)	2	142
ITALIAN (optional)	2	151
BIBLE	1	235
THEME	1	62

SENIOR YEAR

First Term.

GRAPHIC STATICS	1	698
HYDRAULICS	3	662

* See pages 85-136.

	Periods per week.	Course number.*
ROOFS AND BRIDGES	2	691
MACHINE DESIGN	3	1012
THERMODYNAMICS	3	1024
MECHANICAL ENGINEERING LABORATORY	2	1031
TURBINES	2	1022
BIBLE	1	242
THEME	1	62

Second Term.

POLITICAL ECONOMY	2	381
BUSINESS LAW	2	372
REFRIGERATION	3	1052
MECHANICAL ENGINEERING LABORATORY	3	1031
STEAM ENGINE DESIGN	3	1013
ABSTRACTS	2	1071
BIBLE	1	243
THEME	1	62

Third Term.

HEATING AND VENTILATING	3	1051
INDUSTRIAL MANAGEMENT	3	1061
POWER PLANT DESIGN	3	1014
MECHANICAL ENGINEERING LABORATORY	2	1031
ELECTIVE	3	
THESIS	2	1072
BIBLE	1	244

* See pages 85–136.

THE CHEMICAL COURSE.

The aim of this course, which leads to the Degree of Bachelor of Science in Chemistry, is to fit young men for practical work in chemistry, either as chemists in iron and steel works, in manufacturing establishments, or as chemical manufacturers. Great attention is paid to analytical chemistry, and especially to the chemistry of cement and the chemistry and metallurgy of iron and steel. Graduates are fitted to take paid positions as chemists immediately upon graduation. For men of the proper character immediate and remunerative employment can be secured. This course will also be found an excellent preparation for the study of medicine.

Those who take the Chemical Course receive the same instruction in mathematics, drawing, shop-work, modern languages, physics and elementary chemistry up to and including elementary quantitative analysis during Freshman and Sophomore years.

During Junior and Senior years the courses diverge. Those especially interested in metallurgy and in the chemistry of cements and ceramics receive most of their instruction from Professors Hart and Wysor.

Those interested in Organic Chemistry are in charge of Professor Hart and Mr. Taylor. Those interested in Physical Chemistry are instructed by Mr. De Long with the coöperation of Professor Gordon, of the Department of Physics. Those who expect to be Chemical Engineers are advised by Professors Hart and Wysor with the assistance of Professor Rood, of the Engineering Department, while those interested in tanning will receive instruction from Professor Hart and Mr. Taylor with the coöperation of Professor Davison, of the Department of Biology.

Provision is made for new courses as the need arises. This is possible because the instruction is mainly individual and suited to the needs of each student.

While the instruction centers in the two branches of Chemistry and Metallurgy, the course aims to supply a thorough education along the lines most necessary for a successful career as a responsible chemist.

CHEMICAL AND METALLURGICAL LABORATORIES AND EQUIPMENT.

The Chemical and Metallurgical laboratories are contained in Gayley Hall, a new fire-proof structure built for the use of this Department. There are four large and four smaller laboratories and a shop, besides three stock rooms, two balance rooms, two quiz rooms, a lecture room, a room containing the museum and the books of the Henry W. Oliver Chemical and Metallurgical Library, and three rooms for instructors.

The two balance rooms adjoin the quantitative laboratory, and one of them may be entered from the qualitative laboratory.

Two large laboratories each have desk room for 48 students. The qualitative laboratory has desk room for 88 students and the beginners' laboratory for 232. Water and gas are supplied to each student, and each room is supplied with air blast and electric current. They are well lighted, and heated by steam. The smaller laboratories are arranged for assaying, industrial work, gas analysis, microscopic and photographic work, and

GAYLEY LABORATORY OF CHEMISTRY AND METALLURGY.

various other determinations made with the polariscope, spectroscope, calorimeter, etc. For this and other work properly belonging to the department, there is an adequate equipment.

SYNOPSIS OF STUDIES.

CHEMICAL COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA	4	401
CHEMISTRY	4	911
GERMAN†	4	75
OR		
FRENCH‡	4	115
ENGLISH	2	1
DRAWING AND LETTERING	2	441*a*–442
THE BIBLE	1	221
HYGIENE	1	580

Second Term.

	Periods per week.	Course number.*
TRIGONOMETRY	5	411
CHEMISTRY	2	912
GERMAN†	4	71
OR		
FRENCH‡	4	111
ENGLISH	2	2
DRAWING AND PROJECTION	2	441*b*–443*a*
THE BIBLE	1	222

Third Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY	4	416
MENSURATION	1	421

* See pages 85–136.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
CHEMISTRY	4	913
GERMAN‡	4	72
OR		
FRENCH†	4	112
ENGLISH	2	3
DRAWING AND PROJECTION	2	441*c*–443*b*
THE BIBLE	1	223
THEME	1	63

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS	3	426
CHEMISTRY	4	914
ENGLISH	2	4
PHYSICS	4	461
SHOP WORK	2	1001–02
THE BIBLE	1	224
THEME	1	62

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS	5	427
CHEMISTRY	4	915
PHYSICS	4	462
ENGLISH	2	4
SHOP WORK	2	1003–04
THE BIBLE	1	225
THEME	1	62

Third Term.

CHEMISTRY	4	916
PHYSICS	4	463
ENGLISH	2	4
CHEMICAL ARITHMETIC	4	917
SHOP WORK	2	1004
THE BIBLE	1	226
THEME	2	62–63

* See pages 85–136.

† Entered on German.

‡ Entered on French.

JUNIOR YEAR.

First Term.

	Periods per week.	Course number.*
CRYSTALLOGRAPHY	2	511
QUANTITATIVE ANALYSIS	5	918
THEORETICAL CHEMISTRY	2	919
ORGANIC CHEMISTRY	4	920
METALLURGY	2	951
TECHNICAL GERMAN	1	961
BIBLE	1	233
THEME	1	62

Second Term.

	Periods per week.	Course number.*
PETROGRAPHY	2	512
QUANTITATIVE ANALYSIS	5	931
THEORETICAL CHEMISTRY	2	925
ORGANIC CHEMISTRY	4	921
METALLURGY	2	952
TECHNICAL GERMAN	1	962
SPANISH (optional)	2	141
ITALIAN (optional)	2	151
BIBLE	1	234
THEME	1	62

Third Term.

	Periods per week.	Course number.*
QUANTITATIVE ANALYSIS	4	932
THEORETICAL CHEMISTRY	2	925
ORGANIC CHEMISTRY	4	922
MINERALOGY	3	513
SANITARY BIOLOGY	2	561
TECHNICAL GERMAN	1	963
SPANISH (optional)	2	142
ITALIAN (optional)	2	152
BIBLE	1	235
THEME	1	62

SENIOR YEAR.

First Term.

	Periods per week.	Course number.*
QUANTITATIVE ANALYSIS	10	933
CHEMICAL ENGINEERING	2	934

---

* See pages 85–136.

	Periods per week.	Course number.*
GEOLOGY	2	516
TECHNICAL GERMAN	I	964
BIBLE	I	242
THEME	I	62

Second Term.

ANALYTICAL CHEMISTRY (Thesis Work)	6	971
CHEMICAL TECHNOLOGY	2	935
ASSAYING	2	955
GEOLOGY	2	517
ECONOMIC GEOLOGY	2	521
POLITICAL ECONOMY	2	381
TECHNICAL GERMAN	I	965
BIBLE	I	243
THEME	I	62

Third Term.

ANALYTICAL CHEMISTRY (Thesis Work)	12	972
ECONOMIC GEOLOGY	2	521
TECHNICAL GERMAN	I	966
BIBLE	I	244

* See pages 85–136.

COURSES.

ENGLISH LANGUAGE, ENGLISH LITERATURE, COMPARATIVE PHILOLOGY.

Professors F. A. March, Jr., J. W. Tupper, and Messrs. Bye, Cooke, Hench and Beatty.

The work in this department aims, first, to train the student in speaking and writing English correctly. This training begins with the theme work in the Freshman year and is continued throughout the course.

The work in the upper classes is divided into the study of the language and the study of the literature. Its purpose is the interpretation of masterpieces, the rethinking of the thoughts of master minds. The study of the language consists of a study of the principles of grammar, rhetoric, etymology, phonetics, prosody, and other material of philological investigation according to the progressive course outlined in Dr. March's Method of Philological Study of the English Language and the application of the results of such work to the text of some standard author. Bunyan, Spenser, Chaucer, Shakespeare, Bacon and Milton are taken up in this way, and courses in fiction and the drama are given associated with an examination of the language of some novel or play. This course ends with the study of Dr. Whitney's Lectures on Language.

The work in English Literature consists of a course of lectures beginning with the Elizabethan period and continuing down to the present time. The course extends over the Junior and Senior years and is accompanied by special reading and by weekly and term reports.

Dr. March's Anglo-Saxon Grammar and Reader is used as the basis for a course in Anglo-Saxon given in connection with the study of the English Language.

For training in speaking and writing English correctly every student is required to hand in two themes in every term in his College course after Freshman year. Many of them are read in class and criticized as time allows. In this work professors of all departments take part. It is desired that students in each department shall write on subjects connected with it in the words and phrases current among experts, and know the precise meaning of these words and phrases. In these matters the professors in each department are authorities.

1-2-3. COMPOSITION AND RHETORIC.—Themes. Conferences every two weeks. Outside reading. First, second and third terms, Freshman year. Two periods per week.

4. ENGLISH LITERATURE AND COMPOSITION.—Preparation **1-2-3.** The study of the leading English authors from the Elizabethan period to the present time. Lectures and recitations, outside reading and weekly reports. First, second and third terms, Sophomore year. Two periods per week.

10. ANGLO-SAXON.—March's Anglo-Saxon Grammar and Reader. Second term, Sophomore year. Two periods per week.

11-12-13. ADVANCED ANGLO-SAXON.—Preparation: **10:** March's Anglo-Saxon Grammar and Reader and additional reading as assigned. Gilbert Prize in Old English (see page 169). First, second and third terms, Junior or Senior year. One period per week.

14. ENGLISH LANGUAGE.—Trench on the study of Words. Trench Prize (see page 168). First term, Sophomore year. Two periods per week.

15. ENGLISH LANGUAGE.—Sentence Construction. First, second and third terms, Sophomore year. Two periods per week.

16. English Language.—Bunyan's Pilgrim's Progress, English Syntax, Rhetorical Forms, Grammatical Equivalents, Essays on Bunyan's Life, Times and Works. First term, Sophomore year. Two periods per week.

17. English Language.—Spenser's Faery Queen, Etymology, Romance of Chivalry, Spenserian Stanza, Essays on Spenser's Life, Times and Works. Second term, Sophomore year. Two periods per week.

18. English Language.—Chaucer's Canterbury Tales, Phonetics Orthographic Forms, Essays on Chaucer's Life, Times and Works. Lounsbury Prize (see page 167). Second term, Sophomore year. Four periods per year.

19. English Language.—Shakespeare. Lectures, Weekly Essays on Shakespeare's Life, Times and Works. Two periods per week. Francis Bacon: Study of the Essays. Lectures, Weekly Essays on Bacon's Life, Times and Works. First term, Junior year. Two periods per week.

20. English Language.—Shakespeare. Study of Hamlet and other Shakespearean Tragedies. Two periods per week. John Milton: Study of His Poetic Works. Weekly Essay. on Milton's Life, Times and Works. Two periods per week. Second term, Junior year.

21. English Language.—Study of As You Like It and other Shakespearean Comedies. Lectures, Weekly reports, Dramatic Criticism. Shakespeare Prize (see page 171). Two periods per week. Henry W. Longfellow. Essays and reports on Longfellow's Times and Works. Two periods per week. Third term, Junior year.

22. English Language.—English Fiction. Lectures, Assigned Reading, Book Criticism, Weekly Essays. Two periods per week. Dickens, Our Mutual Friend. Essays on Dickens' Times and Works. Two periods per week. The Francis A. March Prize (see page 167). First term, Senior year.

23. English Language.—The English Drama. Lectures and required reading. Two periods per week. English Fiction (continued). Two periods per week. Second term, Senior year.

24. ENGLISH LANGUAGE.—The English Drama. Study of Assigned Texts. Lectures. Weekly Reports. Two periods per week. English Fiction (concluded). Two periods per week. Third term, Senior year.

30–31. COMPARATIVE PHILOLOGY.—Whitney's Language and the Study of Language. Third term, Senior year. Three periods per week.

41–42. SIXTEENTH AND SEVENTEENTH CENTURY LITERATURE.—Lectures, Weekly reports, Assigned reading. First and second terms, Junior and Senior years. Four periods per week.

43. EIGHTEENTH CENTURY LITERATURE.—Lectures, Weekly reports, Assigned reading. Third term, Junior and Senior years. Four periods per week.

44. THE ROMANTIC POETS, 1790–1832.—Lectures, Weekly reports, Assigned reading. First term, Junior and Senior years. Four periods per week.

45–46. LATER NINETEENTH CENTURY LITERATURE.—Lectures, Weekly reports, Assigned reading. Second and third terms, Junior and Senior years. Four periods per week.

41–42–43. Given in 1912–13.

44–45–46. Given in 1913–14.

ELOCUTION.

Prof. March, Jr., and Mr. Beatty.

51–52. ELOCUTION.—Delivering of selected pieces. Required in the Classical and Latin Scientific Courses. Optional in all others. Second and third terms, Freshman year.

53–54–55. ELOCUTION.—Delivering of selected pieces. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. First, second and third terms, Sophomore year.

56–57–58. ELOCUTION.—Delivering of original addresses on chosen subjects. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. First, second and third terms, Junior year.

59-60. ELOCUTION.—Delivering of unwritten addresses on assigned subjects. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. First and second terms, Senior year.

61. ELOCUTION.—Graduating Orations. Required in the Classical, Latin Scientific and General Scientific Courses. By special appointment in all others. Third term, Senior year.

THEME.

62. Every student is required to hand in each term a theme upon a subject assigned by one of the departments.

63. Every technical student who does not take the Summer School in Surveying, is required to present a Theme, typewritten upon sheets 8½″ x 10½″ in size, of not less than 2500 or more than 5000 words, upon a subject approved by the head of his department, on or before the Monday following the opening day of each fall term.

GERMAN AND ROMANCE LANGUAGES.

Professors Raschen and Hopkins and Messrs. Larned, Williams, Boethius and English.

Courses 71, 72 are prescribed for technical students who have entered on French. 75 is prescribed for technical students who have entered on German.

71. ELEMENTS OF GERMAN.—Elements of Grammar and Syntax. Prose Composition followed by reading of easy narrative German prose. Second term, Freshman year. Four periods per week.

72. INTERMEDIATE GERMAN.—Preparation: **71.** Reading of narrative prose of difficult character. Composition. Third term, Freshman year. Four periods per week.

75. ADVANCED GERMAN.—Preparation: Entrance German B.—Composition and reading from modern writers as Riehl, Wildenbruch, Fulda, etc., and the translation of easy scientific German. Part of the term will be devoted to reading of scientific German

of an advanced character. First term, Freshman year. Four periods per week.

80. ELEMENTS OF GERMAN.—Prescribed for Sophomores in the Classical Course. This Course, in conjunction with Course **81**, aims to give a thorough and accurate training in the rudiments of Grammar; to familiarize the student with spoken German as well as written; for this reason the direct method will be employed, using German entirely from the beginning. The student is quickly made to acquire both "Sprachgefuehl" and "Sprachmaterial" so as to understand and speak German with ease. Dictation composition and translation of easy graduated text forms part of the exercise each hour. Third term, Sophomore year. Three periods per week.

81. ELEMENTS OF GERMAN.—(Continued.)—Prescribed for Juniors in the Classical Course. First term, Junior year. Three periods per week.

82–83. INTERMEDIATE GERMAN.—Preparation: **81.** Reading of novels and dramas by modern writers such as Heyse, Keller, Fulda, Mörike, Sudermann. Second and third terms, Junior year. Two periods per week.

84–85–86. ADVANCED GERMAN.—Preparation: Entrance, German B. Prescribed for Freshmen in the Latin Scientific Course. The study of accidence, syntax and etymology will form part of this course which will be carried on by the direct method. Composition as well as reading of advanced texts, which will be selected so as to vary the reading and to acquaint the student with a variety of styles of German writers. In addition to this an easy text will be assigned for outside reading during the second and third terms. First, second and third terms, Freshman year. Four periods per week.

87–88. NINETEENTH CENTURY WRITERS.—Preparation: **86.** Prescribed for Sophomores in the Latin Scientific Course who have entered on German. This course consists of the study of Prose-fiction of the 19th century. The classes will be conducted in German as far as practicable. Written exercises in German will constitute part of the work. First and second terms, Sophomore year. Two periods per week.

89. HISTORICAL PROSE.—Preparation: **88.** Prescribed for Sophomores who have entered on German. Selected readings from German historical writers, and from addresses in the Reichstag. Third term, Sophomore year. Two periods per week.

90–91–92. SCHILLER AND GOETHE.—Preparation: **89.** The lives and several of the principal works of these authors will be studied. Lectures on the various aspects of these works are given to supplement the studies and readings in biography and criticism assigned. Elective. First, second and third terms, Junior year. Two periods per week.

93–94–95. GOETHE'S FAUST.—Preparation: **92.** Alternates with **96–98.** The reading and interpretation of Faust, the First Part in its entirety, the Second Part in selected portions. The study will comprise its genesis, significance, ethics, and artistic character. It is open to those who complete the course on Goethe. Elective. First, second and third terms, Senior year. Two periods per week.

96–97–98. HISTORY OF THE GERMAN DRAMA OF THE 19TH CENTURY.—Preparation: **87–89.** The reading and criticism of the various types of modern drama together with a study of their sources and influence. (Alternates with **93–95.**) Elective. First, second and third terms, Senior year. Two periods per week.

99–100–101. HISTORY OF GERMAN LITERATURE; from the earliest beginnings to the end of the Eighteenth Century.—Preparation: **87–89** or **90–92.** Lectures and collateral reading and study of the literary movements in Germany. First, second and third terms, Senior year. Two periods per week.

102–103–104. TEACHER'S COURSE.—Preparation: **89** (or subsequent courses). This course is intended for those who are planning to teach German. Lectures on and discussions of methods and organization. Treatment and systematization of difficulties of German grammar. One hour per week through the year.

FRENCH.

Courses 111, 112 are prescribed for technical students who have entered on German.

111. ELEMENTS OF FRENCH.—Elements of German and Syntax. Prose composition in connection with reading of easy narrative French prose. Second term, Freshman year. Four periods per week.

112. INTERMEDIATE FRENCH.—Preparation: **111.** Reading from scientific prose. Third term, Freshman year. Four periods per week.

Course 115 is prescribed for technical students who have entered on French.

115. ADVANCED FRENCH.—Preparation Entrance French B. The course will comprise French prose composition and reading of standard French authors. First term, Freshman year. Four periods per week.

126. ELEMENTARY FRENCH.—Prescribed for Sophomores in the Classical and Latin Scientific Courses. Fraser and Squair's Grammar; composition; sight reading and translation of easy prose; careful drill in pronunciation. First term, Sophomore year. Two periods per week.

127. FRENCH.—Continuation of foregoing; thorough study of irregular verbs; grammar; composition; translation; sight-reading. Second term, Sophomore year. Two periods per week.

128. FRENCH.—Grammar and composition continued; translation and sight-reading from Guerlac's Standard French Authors; discussion of the various works of the authors represented. Comfort's Prose Translation. Third term, Sophomore year. Two periods per week.

129. FRENCH.—Readings in French history; discussions. First term, Junior year. Two periods per week.

130. FRENCH.—The Novel. Selections from Dumas' Les Trois Mousquetaires or Hugo's Notre Dame. Lectures. Second term, Junior year. Two periods per week.

131. FRENCH.—The School of the Realists. Readings from Zola's Débacle. Collateral reading in History of French Literature. Lectures. Third term, Junior year. Two periods per week.

132. FRENCH.—The Classical Drama—Tragedy. Study of the

works of Corneille, Racine and Rotrou. Lectures. First term, Senior year. Two periods per week.

133. French.—The Classical Drama—Comedy. Works of Molière. Lectures. Second term, Senior year. Two periods per week.

134. French —Rise of the Romantic School. Hugo's Ruy Blas or Hernani. Lectures. Third term, Senior year. Two periods per week.

135. French.—The Literature of the XVIth Century. Selections from Ronsard Marguerite de Valois, Marot, Jodelle, etc. The Pléiade. Alternates with 133. Second term, Senior year. Two periods per week.

136. French.—Historical Grammar. Development of French from Latin. Alternates with 133–134. Third term, Senior year. Two periods per week.

SPANISH.

141. Spanish.—This course is designed to give the elements of Spanish grammar and to enable the student to translate easy prose from English into Spanish and *vice versa*. Second term, Junior or Senior year. Two periods per week.

142. Spanish.—Continuation of 141. Third term, Junior or Senior year. Two periods per week.

ITALIAN.

151. Italian.—Elements of Italian grammar. Translation of prose from Italian into English and *vice versa*. Second term, Junior or Senior year. Two periods per week.

152. Italian.—Continuation of 151. Third term, Junior or Senior year. Two periods per week.

THE GREEK LANGUAGE AND LITERATURE.

Professors Youngman (Professor Emeritus) and Rankin.

The aim in the Greek courses leading to the A.B. degree is to secure a mastery of the language, for which an exact knowledge of forms of words and of the essential principles of syntax is indispensable. Particular attention is paid to the study of Greek prose during the first term of Freshman year. A correct understanding of the significance of words is also sought through the study of their inherent root meanings, while Greek idioms and forms of expression are learned by way of contrast with those of the Latin and English languages.

But the chief end in view is to acquire an appreciation of Greek literature and, through this medium, of the Greeks themselves. The History of Greek literature is learned through association of authors with contemporaneous historical events. The political history and institutions of the Greeks, their daily life, their customs and their religious beliefs are studied hand in hand with their language and literature. The student is encouraged to read largely in the representative authors selected for study in the class room. Themes on subjects drawn from various phases of Greek life are required in connection with the regular work. In this way the close relationship of the Greek of Classical times and the man of to-day is more perfectly realized.

In the required work of the first two years the prose writers are represented in the reading of the early Attic orators, of Herodotus, of Xenophon, and of Plato. In poetry large parts of both Iliad and Odyssey are read, and the student is introduced to the Greek drama in plays of Sophocles, Euripides and Aristophanes.

In the elective Greek, for the present courses are offered to qualified Juniors and Seniors, four hours a week, throughout the year.

For 1913–1914 the courses offered will comprise the study of selected plays of Aristophanes and Menander, representing the Old and the New Comedy, of Thucydides (books VI and VII) and of the Lyric poets and Theocritus. The reading of these authors will be accompanied by parallel reading in the origin and development of Greek comedy and in the history of the Peloponnesian war, in the history of the period of the Sicilian expedition, and by a review of the early and Alexandrian periods of Greek literature. During 1914–1915, courses will be offered in Demosthenes and Aeschines on the Crown and in selected plays of Sophocles and Aeschylus.

Additional courses will be offered, by way of substitution, from time to time in Lucian, in Aristotle's Poetics and Constitution of Athens and in Plato's Protagoras and Republic.

Following is a synopsis of the courses offered:

161. LYSIAS, the oration against Eratosthenes and some of the shorter orations (Adams). Plato, *The Apology*, and Xenophon, selections from the *Memorabilia* (Dyer and Seymour). Greek Prose Composition (Higley). First term, Freshman year. Four periods per week.

162. HERODOTUS, books VII and VIII (Smith and Laird). "A History of Greece," Oman, to Chapter XXVIII (the death of Pericles, 429 B. C.). Second term, Freshman year. Four periods per week.

163. Homer, *The Iliad*, books XIX–XXIV (Clapp). "A History of Greece," Oman, from the death of Pericles to the death of Alexander the Great, 323 B. C. Third term, Freshman year. Four periods per week.

164. HOMER, *The Odyssey*, books I–XII (Merry). "Life of the Ancient Greeks," Guilick. Themes on Greek life. First term, Sophomore year. Four periods per week.

165. "SELECTIONS FROM THE ATTIC ORATORS," Jebb. "Greek Literature," Jebb. Second term, Sophomore year. Four periods per week.

166. INTRODUCTION TO THE GREEK DRAMA. Euripides, *Iphigenia among the Taurians* (Jerram); Sophocles, *Antigone* (Jebb and

Schuckburgh); Aristophanes, *The Clouds* (Merry). Assigned reading in the history of the Greek Drama and in scenic antiquities. Third term, Sophomore year. Four periods per week.

167. DEMOSTHENES AND AESCHINES ON THE CROWN (Simcox and Simcox). Review of the period of Philip and Alexander. Greek Constitutional Antiquities. Elective. First term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1914–1915.)

168. GREEK TRAGEDY. Sophocles, *Oedipus the King* (Jebb), *Oedipus at Colonus* (Jebb and Schuckburgh), and *Electra* (Jebb and Davies). Parallel reading in works on the Greek Drama. Elective. Second term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1914–1915.)

169. GREEK TRAGEDY. Aeschylus, *Prometheus Bound* (Prickard), *Seven against Thebes* (Sidgwick), *Eumenides* (Sidgwick). Parallel reading. Elective. Third term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1914–1915.)

170. GREEK COMEDY. Aristophanes, *Birds*, *Frogs*, and *Acharnians* (Merry). Menander, fragmentary plays (Capps). Elective. First term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1913–1914.)

171. THUCYDIDES, books VI and VII (Lamberton). Review of the period of the Sicilian Expedition. Elective. Second term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1913–1914.)

172. LYRIC POETS, selections (Tyler). Theocritus (Cholmeley). Elective. Third term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1913–1914.)

For students who do not offer Greek for entrance the following courses are available and may be substituted, throughout the year, for certain other courses in the College curriculum. (See page 43.)

179. BEGINNER'S GREEK BOOK (Benner and Smythe). Xenophon,

Anabasis, books I and II (Smith). Sub-Freshman course, four periods per week, through the entire year.

180. XENOPHON, *Anabasis*, books II–IV (Smith). Homer, *the Iliad*, books I–III (Seymour). Sub-Freshman course, four periods per week, through the entire year.

THE LATIN LANGUAGE AND LITERATURE.

Professor Owen and Messrs. Lacey, Larned and English.

It is the aim of this Department to give the students an intelligent acquaintance with the language, literature and institutions of Rome, and qualify them for the efficient treatment of these subjects as teachers, or for the further scholarly pursuit of these and kindred studies after graduation if they should be so disposed. An effort is made to unite accuracy in details with facility in reading within the limits of a reasonable range.

It is kept in mind, also, that the training in this Department should be practically helpful and valuable to those who are to speak and write the English language. With a view to cultivate the power of expression, besides the oral work of the class room, there are frequent exercises in writing, in which it is sought to faithfully render the author into the English of our literary standards.

181. LIVY.—Books XXI–XXII, with Roman History and Latin Prose. First term, Freshman year. Four periods per week.

182. HORACE.—Odes and Epodes. Latin Prose. Second term, Freshman year. Four periods per week.

183. HORACE.—Satires and Letters with Roman Antiquities. Third term, Freshman year. Four periods per week.

184. CICERO.—De Oratore with history of the last Century of the Roman Republic. First term, Sophomore year. Four periods per week.

185. Latin Hymns.—Latin Hymns with Early Roman Literature. Second term, Sophomore year. Four periods per week.

186. Cicero.—De Officiis. Third term, Sophomore year. Two periods per week.

187. Tacitus.—Agricola and Germania. Roman Literature of the Silver age. First term, Junior year. Two periods per week.

188. Juvenal.—Roman Archaeology, illustrated by an Extensive Collection of Roman photographs. Second term, Junior year. Two periods per week.

189. Tacitus.—Annals. Third term, Junior year. Two periods per week.

190. Lucretius.—First term, Senior year. Two periods per week.

191. Epistolary Latin.—Pliny and Cicero. Second term, Senior year. Two periods per week.

192. Cicero's Tusculan Disputations.—Third term, Senior year. Two periods per week.

THE HEBREW LANGUAGE.

Rev. Robert Robinson.

201. Elementary Hebrew.—Etymological principles of Hebrew; inflections and laws of euphonic changes. Elective. Second term, Senior year. Two periods per week.

202. Hebrew (Continued).—Translation of portions of Old Testament History from Hebrew into English, and from English into Hebrew. Elective. Third term, Senior year. Two periods per week.

THE BIBLE.

The President, Professors Youngman, Hardy, Owen, Raschen, Roberts, Lyle, Rankin, Hopkins, Marquard and Messrs. Lacey, Cawley, Hatch, Larned, Boethius, Snyder, English, Hench and Beatty.

In the Freshman year a general survey of the Bible will be made with the purpose of impressing upon the students the character of its contents, the various books and their relation to the whole, and familiarizing them with its actual language and ideas. So far as may be profitable for this dominant purpose, instruction will be given in Bible history and geography, but the great object is to make the student familiar with the very words of the English Bible.

The Sophomore year is devoted to a detailed study of one of the synoptic gospels. Those who study Greek use the Greek Testament; those taking the Latin Scientific course, a Latin version; and the Technical students use a French version.

The Acts of the Apostles is studied in the Junior year. Special attention is given to the lives and labors of the Apostles and the founding of the Christian Church.

In the Senior year the first half year is devoted to a course in the early history of Christianity in which Uhlhorn's Conflict of Christianity with Heathenism is the text-book; the second half to the external history of the English Bible, its translators and translation.

221–22–23. THE BIBLE.—General survey of the Old Testament and the Life of Christ. Required of all students throughout the Freshman year. One period per week.

224–25–26. THE NEW TESTAMENT.—The Gospels, in French. Required of Technical students throughout the Sophomore year. One period per week.

227–28–29. THE NEW TESTAMENT.—The Gospels, in Greek. Required of Classical students throughout the Sophomore year. One period per week.

230–31–32. THE NEW TESTAMENT.—The Gospels, in Latin. Required of Latin Scientific students throughout the Sophomore year. One period per week.

233–34–35. THE NEW TESTAMENT.—The Acts of the Apostles, in German. Required of Technical and General Scientific students throughout the Junior year. One period per week.

236–37–38. THE NEW TESTAMENT.—The Acts of the Apostles in the Greek. Required of Classical students throughout the Junior year. One period per week.

239–40–41. THE NEW TESTAMENT.—The Acts of the Apostles, in Latin. Required of Latin Scientific students throughout the Junior year. One period per week.

242–43. CHURCH HISTORY.—Uhlhorn's Conflict of Christianity with Heathenism. Required of all students. First and second terms, Senior year. One period per week.

244. HISTORY OF THE ENGLISH BIBLE.—Required of all students. Third term, Senior year. One period per week.

PHILOSOPHY.

Professor Mecklin.

The required courses in Philosophy are Logic, Psychology, Ethics, and Theism. They are continuous and cover five consecutive terms beginning with the first term of the Junior year. In addition to these, elective courses are offered in the History of Philosophy, Advanced Psychology, the Psychology of Education and the History of Education.

251. LOGIC.—Two hours a week during the third term of the Junior year. The aim of this course is to acquaint the student with the laws of discursive thinking, particular emphasis being laid upon ambiguity, the fallacies and the principles of scientific method (Creighton, *An Introductory Logic*, or Bode, *An Outline of Logic*).

252. PSYCHOLOGY.—Two hours a week during the first term and three hours during the second term of the Junior year. In this course the student gains a knowledge of the simpler facts of the mental life and their relations to the physiological basis in the sense organs and the nervous system. The lectures are supplemented by parallel reading and simple experiments and exercises (Angell, *Psychology*).

253. ADVANCED PSYCHOLOGY.—Two hours a week throughout the Senior year. This is a continuation of Course **252** and is intended to supplement the courses in Ethics and Education. It consists of lectures and parallel readings with reports, and alternates with **303**.

254. INTRODUCTION TO PHILOSOPHY.—Two hours a week during the third term of the Junior year. This course is designed to introduce the student to the main problems of Epistemology and Metaphysics and to acquaint him with the scope and relations of special philosophical disciplines (Kuelpe, *Introduction to Philosophy* or Jerusalem, *Introduction to Philosophy*).

281. ETHICS.—Three hours a week during the first term of the Senior year. The facts of the moral life are presented as a series of problems such as the problem of the origin of moral sentiment, of the content of moral judgment, of the end or standard, etc. The method adopted is genetic, and ultimate principles are attained through an analysis of the familiar facts of experience (Muirhead, *The Elements of Ethics*, or Dewey and Tufts, *Ethics*).

291. ANCIENT AND MEDIAEVAL PHILOSOPHY.—Two hours a week during the first term of the Senior year. This course traces the rise and development of the philosophical impulse through the Greek, the Greco-Roman and the mediaeval periods. The attempt is made to correlate the various philosophical tendencies with the civilizations that fostered them (Weber, *History of Philosophy*, Rogers, *Student's History of Philosophy*, Windelband, *A History of Philosophy*).

292. MODERN PHILOSOPHY FROM DESCARTES TO HEGEL.—Two hours during the second term of the Senior year. In this course, which is a continuation of Course **291**, the classical philosophical systems from Descartes to the German Idealists are discussed and analyzed. Rand's, *Modern Classical Philosophers* is used as parallel reading.

293. PHILOSOPHY OF THE NINETEENTH CENTURY.—Two hours during the third term of the Senior year. A continuation of Courses **291** and **292**, in which particular attention is given to the philosophical tendencies of the present time.

301. HISTORY OF EDUCATION.—Two hours a week throughout the Junior or Senior year. Text-book, Monroe's *A Brief Course in the History of Education*, with parallel reading and reports. This Course alternates with courses **291–3**.

302. THEISM.—Two hours a week during the first term of the Senior year. This course sets forth the grounds of theistic belief as necessary to a broad and liberal culture and sound Christian scholarship. The anti-theistic theories such as pantheism, materialism, positivism, etc., receive critical attention. (Flint, *Theism and Anti-Theistic Theories*.)

303. PSYCHOLOGY OF EDUCATION.—Two hours throughout the Senior year. This course alternates with course **253**. Text-book, Bagley's *Educative Process* or Horne's *Psychological Principles of Education*.

LECTURES ON EDUCATION.—In view of the increased requirements for teachers embodied in this state, an effort has been made to extend the courses in education given in connection with the department of philosophy and to supplement these by others bearing more directly upon the practical side of the teacher's work.

Lafayette is particularly fortunate in the large number of her graduates that have distinguished themselves in the field of secondary education and it is planned to have various alumni actively engaged in educational work deliver annually a course of six lectures upon practical educational problems. During the college year of 1911–12, Rev. D. J. Waller, D.D., of Bloomsburg, Pennsylvania, delivered six lectures upon school methods and management as follows: 1. A Democratic System of Education; 2. The Child; 3. The Youth; 4. School Management; 5. Methods; 6. Ethics in Teaching. The course for the present college-year will be delivered by Rev. Samuel A. Martin, D.D., of Shippensburg, Pennsylvania.

HISTORY, POLITICAL AND SOCIAL SCIENCE.

The President, and Professors Owen, Roberts and Rankin, and Messrs. Lacey, Kirkpatrick, Larned, Beatty and English.

The work of this department is designed to give such a general knowledge of History and Political Science as belongs to a liberal education. At the same time sufficient work is offered in the electives to well equip for their future work and study students who desire to take up graduate work or to engage in the practice of law or the public service or teaching. The instruction is given by text-books, by lectures, and by library references, the students reporting the results of their reading partly during the regular work of the class, and partly in the form of essays. The subjects covered by the course are in detail as follows:

311. ANCIENT HISTORY.—Survey of the history of Greece and Rome in connection with the courses in Latin and Greek. Political, Social, literary and philosophical history of each epoch. Classical Geography.

312. ANCIENT HISTORY.—This course covers the field of general history from the earliest times to the downfall of the Western Roman Empire. The methods comprise a text-book, lectures, collateral reading, and frequent written tests. First term, Sophomore year. Two periods per week.

313. MEDIAEVAL AND MODERN EUROPEAN HISTORY.—This is a general course in European History from the Teutonic Migrations. Second and third terms, Sophomore year. Two periods per week.

321–22. HISTORY OF ENGLAND.—The narrative History of England is made the basis of study, but especial attention is given to the economic, social and intellectual history of the country, and to the development of English institutions. The general aim of this course, in its method, is to prepare for the courses in American History. Green's Short History of the English People is used as a text-book, and the importance of collateral readings is emphasized. First and second terms, Junior year. Two periods per week.

331. AMERICAN HISTORY.—The course in Colonial History is intended to trace the beginnings of the American nation rather than the details of the history of the individual colonies. Emphasis is therefore laid on the European inheritance brought to this country by the colonists, their development of American institutions in the new environment, the expansion of population, the struggle between France and England for North America, the underlying causes of the Revolution, the growth of independence and union. Thwaite's The Colonies and Hart's Formation of the Union are used as text-books, supplemented by lectures, reading and reports. Second term, Junior year. Two periods per week.

334. AMERICAN HISTORY AND CIVICS.—A one-year course for the General Scientific students in the literature division of that course. Freshman year. Two periods per week.

351. CONSTITUTIONAL HISTORY.—The United States. A required course dealing with the Constitution from the point of view of its historical development. Fiske's Critical Period of American History is used as an introduction to this course, and it is accompanied by a critical study of several important constitutional documents, such as Magna Charta, the Petition of Right, the Articles of Confederation, and the Ordinance of 1787. Then the Constitution is taken up section by section and studied with reference to its historical development and its subsequent interpretation and construction. Third term, Junior year. Four periods per week.

352-53. CONSTITUTIONAL HISTORY.—The United States (Continued). Preparation: 351. Detailed study of the subject, with Bryce's American Commonwealth as an introduction and general guide. Lectures, discussions and written reports on questions of American citizenship. Elective. Second and third terms, Senior year. Two periods per week.

361–62–63. General Constitutional History.—An elective course in General Constitutional History is begun in the first term of the Senior year and continued through the second and third terms. It begins with the origin of the state, and following the plan of Woodrow Wilson's The State pursues the development down to the present time. The recitations are supplemented by lectures and reading, with written reports of investigations. Two periods per week.

371–72. Law.—Elective courses in Blackstone's Commentaries and Business Law. Second and third terms, Senior year. Two periods per week.

376. International Law.—The course in International Law undertakes to do little more than to exhibit the fundamental principles which govern international affairs, and by the study of a few important cases to show the method of diplomatic procedure. It is especially intended to give the students the information needed to understand current discussions of foreign relations. Text-book—Lawrence's Principles of International Law. First term, Senior year. Two periods per week.

381–82. Political Economy.—The course in Political Economy consists of a rapid survey of the principles during second term, Senior year, and of the discussions of practical application of economic theories during the third term. Special attention, however, is given to the questions which are vital issues of the day, such as Finance and the Tariff. The utmost care is taken to avoid the teaching of party politics under the guise of Economic Science. At the same time the teaching in this department recognizes the importance of inculcating honest views on the money question and the right of American citizens to know what can be said for the American policy of Protection both in the abstract and in its actual workings. Second and third terms, Senior year. Two periods per week.

MATHEMATICS.

Professors Hardy, Hall and Marquard, and Messrs. Hatch, Cawley, Snyder and Bray.

It is strongly recommended that algebra be thoroughly reviewed just before admission to college.

401. Algebra.—Binominal theorem, theory of logarithms, prob-

ability, variables and limits, series and theory of equations. Text-book—Wentworth's College Algebra. First term, Freshman year. Four periods per week.

402. ALGEBRA.—Preparation: Entrance Mathematics B. Through Ratio, Proportion and Variation. First term, Freshman year. Two periods per week.

403. ALGEBRA COMPLETED.—Preparation: **402.** (Continuation of **402.**) Second term, Freshman year. Four periods per week.

404. ALGEBRA.—To Progressions. Second term, Freshman year. Four periods per week.

405. ALGEBRA COMPLETED.—(Continuation of **404.**) Third term, Freshman year. Four periods per week.

406. GEOMETRY.—Solid Geometry. First term, Freshman year. Two periods per week.

407. GEOMETRY.—Solid Geometry. First term, Freshman year. Four periods per week.

411. TRIGONOMETRY.—The work in this course begins with a rapid review of the elementary Plane Trigonometry. Then follows the advanced Plane Trigonometry, consisting of derivation of formulas and trigonometrical series, solution of right- and oblique-angled triangles and solution of problems involving the practical applications. About one-third of the term is devoted to Solid Trigonometry which is also completed. Text-book—Hall and Funk's Trigonometry. Second term, Freshman year. Five periods per week.

412. TRIGONOMETRY.—Preparation: **403, 406.** Third term, Freshman year. Four periods per week.

413. TRIGONOMETRY.—Preparation: **405, 406.** First term, Sophomore year. Four periods per week.

416. ANALYTICAL GEOMETRY.—The work in this subject consists of the Analytical Geometry of two dimensions, including the point, right line and circle; the conics, tangents, diameters, transformation of coördinates, the general equation of the second degree and higher plane curves; also the Analytical Geometry of three dimensions, including the point, the plane and surfaces of revolution. Text-book—Ashton's Analytic

Geometry. Third term, Freshman year. Four periods per week.

417. ANALYTICAL GEOMETRY (Continued).—First term, Sophomore year. Two periods per week.

418. ANALYTICAL GEOMETRY.—Preparation: **412.** Drawing of curves from their equations; accurate demonstrations of propositions. First term, Sophomore year. Four periods per week.

419. ANALYTICAL GEOMETRY.—Preparation: **418.** (Continuation of **418.**) Four periods per week. Second term, Sophomore year. Four periods per week.

420. ANALYTICAL GEOMETRY.—Preparation: **413.** Same as **418.** Second term, Sophomore year. Four periods per week.

421. MENSURATION.—The work includes the mensuration of the ordinary geometrical magnitudes, conic sections and curved surfaces and solids. The prismoidal formula, Simpson's rule, etc., are given. Text-book—Hall's Mensuration. Third term, Freshman year. One period per week.

426. DIFFERENTIAL AND INTEGRAL CALCULUS.—The work in the Differential Calculus consists of the differentiation of all the functions of one or more variables, successive differentiation, implicit functions, development of function, evaluation of indeterminate forms, maxima and minima, properties of curves and radius of curvature, together with numerous practical applications in Mechanics. In the Integral Calculus are treated the integration of rational, irrational and transcendental functions, integration by parts and successive integration, rectification of curves, quadrature of plane surfaces, surfaces and volumes of solids, centers of gravity of lines, surfaces, and solids, and moments of inertia. Text-book—Hall's Differential and Integral Calculus. First term, Sophomore year. Three periods per week.

427. DIFFERENTIAL AND INTEGRAL CALCULUS (Continued).—Second term, Sophomore year. Five periods per week.

429. DIFFERENTIAL CALCULUS.—Preparation: **419–420.** Elective. First term, Junior year. Four periods per week.

430. INTEGRAL CALCULUS.—Preparation: **429.** Elective. Second term, Junior year. Four periods per week.

431. CALCULUS.—Preparation: **430.** Application of the Calculus to the study of Loci. Elective. Third term, Junior year. Four periods per week.

432. DIFFERENTIAL EQUATIONS.—Preparation: **431.** Elective. First term, Senior year. Two periods per week.

433–44. THEORY OF FUNCTIONS.—Preparation: **432.** Elective. Second and third terms, Senior year. Two periods per week.

436. LEAST SQUARES.—Law of probability of error, adjustment of observations, precision of observations and empirical formulas. The problems are selected with particular attention to the needs of engineers. Text-book—Merriman's Least Squares. Third term, Sophomore year. Two periods per week, for half term.

437. DIFFERENTIAL EQUATIONS.—In this subject are given the principal differential equations of the first order and degree and those of the second order that are of importance in the applied mathematics that follow. Text-book, Hall's Differential and Integral Calculus. Third term, Sophomore year. Two periods per week.

TECHNICAL DRAWING AND DESCRIPTIVE GEOMETRY.

Professor Graves and Mr. Doub.

441*a*. DRAWING.—Use of drawing instruments and materials; elementary plates of such a nature as to give the student practice in using drawing instruments and knowledge concerning the simpler operations of drawing; free-hand pen shading; conic sections. Text-book, "Mechanical Drawing"—Graves. First term, Freshman year. Two 2-hour exercises per week.

441*b*. DRAWING.—Plates concerning the projection, revolution, and successive revolution of geometric solids in connection with course 443*a*. Orthographic Projection; working drawings of machine details, and fastenings such as bolts, nuts and screw threads. Text-book, "Mechanical Drawing" — Graves. Second term, Freshman year. Two 2-hour exercises per week.

441*c*. DRAWING.—Drawings of large structures taken from detail sketches and uncompleted views—such as bent for a timber trestle, squared timber highway bridges, built up steel columns and girders; plates in connection with course 443*b*, Orthographic Projection, tracing and blue-printing. Text-book, "Mechanical Drawing"—Graves. Third term, Freshman year. Two 2-hour exercises per week.

442. LETTERING.—Analytical study of, and practice in, making lower case and capital letters suitable for general engineering drawing; the lettering of connected sentences to acquire facility in spacing; lettering suitable for titles. Text-book, "Freehand Lettering"—Reinhardt. First term, Freshman year. Two 1-hour exercises per week.

443*a*. ORTHOGRAPHIC PROJECTION.—Training the technical imagination and power of visualization in three dimensions through the projection, revolution, and successive revolution of geometric solids; direct application of the principles involved to mechanical drawing. Text-book, "Mechanical Drawing"—Graves. Second term, Freshman year. Two 1-hour recitations per week.

443*b*. ORTHOGRAPHIC PROJECTION.—A consideration of points and lines in their relations to one another and to the three planes of projection, in order to further develop the relationship of orthographic projection to the graphic language of mechanical drawing, and at the same time to lay a firm foundation for the subsequent study of Descriptive Geometry. Text-book, "Orthographic Projection"—Graves. Third term, Freshman year. Two 1-hour recitations per week.

451*a*. DESCRIPTIVE GEOMETRY.—Problems on the point, line and plane. Particular emphasis is laid on the necessity to mentally visualize the problem under discussion. Text-book, "Descriptive Geometry"—Hall. First term, Sophomore year. Two 1-hour recitations and 1 hour of drawing per week.

451*b*. DESCRIPTIVE GEOMETRY.—Generation and properties of surfaces of single and double curvature; intersections and developments of planes with solids and solids with solids; warped surfaces; tangent planes. Text-book, "Descriptive Geometry" —Hall. Lectures. Second term, Sophomore year. Two 1-hour recitations and 1 hour of drawing per week.

451*c*. DESCRIPTIVE GEOMETRY.—The applications of the principles of Descriptive Geometry to isometric drawing; shades and shadows; the shadows of isometric drawings; perspective drawing and shadows. Lectures, recitations, and drawings. Third term, Sophomore year. Two recitations and 1 hour of drawing per week.

452. MACHINE DRAWING.—Neat, free-hand sketches of actual pieces of machinery such as pulleys, gears, shaft hangers, pistons, valves, eccentrics, etc. From these sketches, drawings and tracings are made; class room work on the elements of machine design.
Third term, Sophomore year. Two 2-hour exercises per week.

PHYSICS.

Professor Gordon, Messrs. Moody and Lockwood.

Courses 461-463 constitute the work in Physics required of all students. Technical students take these courses during the Sophomore year and others the third term of Sophomore and the first two terms of Junior year.

461. MECHANICS AND HEAT.—Experimental lectures, recitations and laboratory work. First term, Sophomore or Junior year. Four periods per week.

462. ELECTRICITY AND MAGNETISM.—Experimental lectures, recitations and laboratory work. Second term, Sophomore or Junior years. Four periods per week.

463. SOUND AND LIGHT.—Experimental lectures, recitations and laboratory work. Third term, Sophomore or Junior year. Four periods per week.

464. PHYSICAL MEASUREMENTS.—Recitations and laboratory work. Advanced experiments in Mechanics and Heat. First term. Two periods per week. Elective. Required for Electrical Engineering students.

465. ELECTRICAL MEASUREMENTS.—Recitations and laboratory work. The Wheatstone Bridge, Carey Foster Bridge, Murray and Varley Loops, High and Low Resistance, Temperature Coefficients of Resistance, and other experiments. Second term. Two periods per week. Elective. Required for Electrical Engineering students.

466. ELECTRICAL MEASUREMENTS.—Recitations and laboratory work. The magnetic properties of iron, capacity, inductance, calibration of voltmeters amd ammeters, comparison of electromotive forces. Third term. Two periods per week. Elective. Required for Electrical Engineering students.

467. ADVANCED ELECTRICITY.—Lectures, recitations and laboratory work. The conduction of electricity through gases and radioactivity. First term, Senior year. Two periods per week. Elective.

468. ADVANCED ELECTRICITY.—Portions of Electrostatics, electric waves and the relations between electricity and light. Third term, Senior year. Two periods per week. Elective.

469. ELECTROCHEMISTRY.—Lectures, recitations and laboratory work. Conductivity of solutions, velocity of ions, standard cells, concentration cells, polarization, the thermodynamic and osmotic theory of cells. Third term, Junior or Senior year. Two periods per week. Elective.

470. OPTICS.—Lectures, recitations and laboratory work. The spectrometer, gratings, Fresnel's mirrors and prism, the interferometer, and the polarimeter. Two periods per week. Second term, Senior year. Elective.

MINERALOGY AND GEOLOGY.

Professor Peck and Mr. Fretz.

The course in Geology is continuous and each term's work depends upon that which has preceded. It is desirable that students electing this subject should do so for at least two terms and that they should be familiar with the elements of Physics, Chemistry and Biology.

For the work of the Senior year, a knowledge of these subjects is required.

491. DYNAMICAL, STRUCTURAL AND PHYSIOGRAPHICAL GEOLOGY.—Text-book and illustrated lectures. Elective. First term, Junior year. Two periods per week.

492. HISTORICAL GEOLOGY.—Preparation: **491.** Stratigraphic sequence of rocks, and fossil forms. Elective. Second term, Junior year. Two periods per week.

493. CRYSTALLOGRAPHY.—Preparation: **492.** Crystal forms, properties of crystalline substances, drawing and measurements of crystals. Elective. Third term, Junior year. Two periods per week.

494. PRACTICAL FIELD GEOLOGY.—Preparation: **493.** Elective. First term, Senior year. Two periods per week.

495. ADVANCED CRYSTALLOGRAPHY AND ELEMENTARY PETROGRAPHY.—Preparation: **494.** Elective. Second term, Senior year. Two periods per week.

496. FIELD GEOLOGY.—Preparation: **495.** Elective. Third term, Senior year. Two periods per week.

511. CRYSTALLOGRAPHY.—This course is illustrated with glass and wooden models, and each alternate exercise consists of a practicum at which well-crystallized minerals are studied, and their properties discussed. The latter part of the term is devoted to a brief discussion of the optics of crystals. Text-book—Williams' Elements of Crystallography. First term, Junior year. Two periods per week.

512. PETROGRAPHY.—A large collection of hand specimens of rocks with thin sections is used in this study. Text-book—Kemp's Handbook of Rocks. Second term, Junior year. Two periods per week.

513. MINERALOGY.—A systematic review of mineral species, more special attention being paid to their chemical and crystallographic relations and to their mode of occurrence in nature. Instruction in given by lectures which are illustrated by a study collection consisting of some two thousand specimens, including the most important species. A course in determinative mineralogy supplements these lectures. The student is

MARTIEN, FAYERWEATHER AND POWELL HALLS.

required to determine sixty minerals and to write out a description of each. Third term, Junior year. Three periods per week.

516. GENERAL GEOLOGY.—Dynamical, Structural and Physiographical Geology. The work of the class-room is supplemented by excursions into the neighboring region, and sufficient time is devoted to field work to enable each student to construct a ten-mile section up and down the Delaware River at Easton. Text-book—Scott's Introduction of Geology. First term, Senior year. Two periods per week.

517. GENERAL GEOLOGY.—Continuation of Course **516.** Historical Geology. Accumulations, organic and inorganic, which are of economic importance. Text-book—Scott's Introduction to Geology. Second term, Senior year. Two periods per week.

521. MINING GEOLOGY. ECONOMIC GEOLOGY.—Practical geology of the metalliferous deposits. This is a lecture course, but reading is assigned in the following works: "Economic Geology of the United States," Ries; "Ore Deposits of the United States and Canada," Kemp; "The Nature of Ore Deposits," Beck; etc. Second term, Senior year. Two periods per week.

522. MINING GEOLOGY. FIELD GEOLOGY.—In this course the student makes a detailed study of an area, from which he constructs a colored geological map and geological sections. Specimens of the different rocks and ores are collected and thin sections are cut for microscopical examination. Third term, Senior year. Two periods per week.

523. MINING GEOLOGY.—Elective. First term, Senior year. Two periods per week.

524. MINING GEOLOGY.—Elective. Second term, Senior year. Two periods per week.

ASTRONOMY.

Professor Hardy and Mr. Cawley.

531. DESCRIPTIVE ASTRONOMY.—Fundamental definitions of the celestial sphere, parallax, refraction, the earth as an astro-

nomical body, the sun, the moon eclipses and the planets. Text-book—Young's Astronomy. First term, Senior year. Two periods per week.

536. Descriptive Astronomy.—More detailed course than 531. First term, Senior year. Four periods per week.

541–42. Practical Astronomy.—The use of the sextant in determining time by a single altitude of the sun, by a single altitude of a star, by equal altitudes of the sun, by equal altitudes of a star; in determining latitude by the meridian altitude of a star in any position and by circummeridian altitudes. The instrument constants of the transit instrument and its use in determining longitude. The use of the zenith telescope in determining latitude. The sections of the class are made so small that each student gets considerable practice with the instruments. Second and third terms, Senior year. Two periods per week.

BIOLOGY.

Professor Davison and Mr. Foster.

The work of this Department occupies all of the ten rooms in Jenks Biological Hall. A general laboratory, forty by sixty feet, and four special laboratories well equipped with modern apparatus, in addition to an herbarium and vivarium provide ample facilities for pursuing practical studies on plant and animal life.

The courses in Biology, excepting Sanitary Biology required for the Civil Engineers and Chemists, are elective only, and consist of work throughout the Junior and Senior years. They are open for election to Classical, Latin Scientific, and General Scientific students. In order to meet the double purpose of a professional preparation and general culture, the courses are so arranged as to provide in each the special knowledge required without sacrificing the ends of general culture and discipline which is sought in all the undergraduate courses.

Those not wishing to take the complete course, and yet desiring to know the meaning of the life forms, the relation of plants and animals to one another and especially to man, and to understand the factors and methods of evolution, should pursue the work of the last two terms of the Junior year and the first term of the Senior year. One may, however, begin his biological studies at any time prior to the second term of the Senior year. The work of the second and third terms of the Senior year is designed for those expecting to enter the professions of teaching or medicine.

551. MAMMALIAN ANATOMY.—This enables the student to secure a definite idea of the structures of his own body, to understand some of the evidences of evolution of animals and realize the unity of structure of the animal kingdom. A discussion of parts of the cat or dog together with studies and demonstrations on certain dissected mammals with special reference to the nervous system makes an excellent preparation for the study of Psychology and Physiology. Elective. First term, Junior year. Two periods per week.

552. VERTEBRATE ZOOLOGY.—The laboratory work involves a study of one or more types representing each of the five classes of vertebrates. The evolution of the various organs and systems and the origin and development of certain forms of animals together with their habits and natural history furnish fertile topics for recitations and lectures. This course, in connection with General Biology, Course 553, gives the student a general survey of the entire animal kingdom. Elective. Second term, Junior year. Four periods per week.

553. GENERAL BIOLOGY.—The morphology and life history of a few types of the invertebrates are studied with a view to understanding the processes of life and the relation of one form of life to another. Darwinism and the allied problems struggle for existence, parasitism, etc., are discussed, and considerable attention is given to the interdependence of animals and plants, and insects and birds. A well-equipped laboratory with

microscopes, aquaria and terraria, offering access to numerous specimens living and preserved, furnishes every advantage to those pursuing this course. Elective. Third term, Junior year. Four periods per week.

554. BACTERIOLOGY AND HEALTH.—Preparation: 551, 553 or 571. This work occupies four periods per week during the first term of the Senior year. A considerable amount of laboratory work, supplemented by investigations in a well-equipped library, and by lectures and demonstrations, is applied to a study of the form, habits and use of bacteria, their relation to agriculture, to industrial processes and to disease. Incubators, water-baths, sand and domestic filters, and microscopes equipped with oil immersion lenses enable the students to make a practical study of the cause and prevention of disease, including disinfection, disposal of sewage, sanitary analysis of water and milk. The necessity and method of ventilation and natural and artificial immunity are treated in the light of the twentieth century knowledge. Elective. First term, Senior year. Four periods per week.

555. PHYSIOLOGY.—Preparation: 551, 553 or 554. The laboratory work consists of the performance of certain experiments and a microscopic study of the chief organs in man. The recitations and lectures are devoted chiefly to the physiological problems relating to the digestive, vascular, respiratory, excretory and nervous systems. Elective. Second term, Senior year. Four periods per week.

556. EMBRYOLOGY AND EUGENICS.—Preparation: 551 or 552 and 555. The maturation and fertilization of the egg of Ascaris, the segmentation of the egg and the formation of the germinal layers in fish and amphibians, and the origin and early development of the chief organs in chick embryos, and the derivation and function of the fetal membranes in birds and mammals constitute the laboratory work. Either Course II or III, and Course VI are required as a preparation for this course. Elective. Third term, Senior year. Four periods per week.

561. SANITARY BIOLOGY.—The cause and prevention of disease, the role of bacteria in the septic tank; the effect of polluted

water on health; biological analysis of water. The Biological Laboratory is used by students in this course prior to their work in Water Supply and Sewerage. It contains equipment fitted for the study of Sanitary Biology, *viz.*, twenty compound microscopes, a dozen aquaria, several sets of Sedgwick-Rafter apparatus, modern sand and house filters, drying ovens, sterilizers, incubators, fermentation tubes, petri dishes, etc., furnishing the necessary facilities for a practical study of the algae, aquatic animals and bacteria relating to sewage disposal and water supply. Required for Civil Engineers and Chemists. Elective for others. Third term, Junior year. Two periods per week.

571. BOTANY.—The time is largely devoted to the study of the morphology and life history of the lower plants from bacteria to ferns and an explanation of the physiological processes in plants. The relation of insects to plants and plants to man, together with the problem of breeding new varieties, are some of the practical topics considered. Excellent advantages for pursuing this branch are offered by the well-equipped laboratory and extensive College Herbarium containing representatives of nearly all the mosses, ferns and flowering plants in Pennsylvania in addition to hundreds of species from other regions of North America. Elective. First term, Junior year. Two periods per week.

HYGIENE.

Professor Davison.

580. Lectures on Health and the general principles of Physiology illustrated with Stereopticon views, charts, and other apparatus. First term, Freshman year. One period per week.

PHYSICAL CULTURE.

Mr. Bruce.

581. PHYSICAL CULTURE.—The work of this department is carried on in the gymnasium, and physical training is required of all students of the Freshman and Sophomore Classes, four periods per week.

SYSTEM.

The course in physical training embraces educational gymnastics, systematic bodily exercises based on scientific principles and founded on physiological rules.

ANTHROPOMETRY AND PHYSICAL DIAGNOSIS.

The student before entering on the course must present himself to the Director for a physical examination. By means of this examination the physical condition of the individual is ascertained. The relative proportions of the parts of the body; the undue development of some muscles and the relaxed and enfeebled condition of others; the comparative size of body and limbs; variations of height, breadth, weight, and muscular strength from the normal standard of a given age are all taken into account in prescribing the course of training. The results of this examination are plotted on anthropometric charts and directions given in booklet form for developing the various parts of the body and correcting individual defects. At the end of the course a second examination is made and the results plotted on the same chart, thus showing the student his exact physical improvement.

Optional courses are offered to upper classmen in advanced gymnastics and instruction in the science of fencing and of wrestling.

In connection with this course a series of in-door games are introduced. The gymnasium is equipped with regulation handball courts and a series of tournaments are held during the second term.

Outdoor exercise is encouraged and cross-country running in a mild form is promoted for the benefit of students who are not members of athletic teams.

At the end of each year, a silver loving cup will be presented by the Director to the student making the greatest improvement in strength, measurements and general gymnastic efficiency, as indicated by the physical examination and the regular class work. All students taking the required work in the gymnasium will be considered as competitors for the cup.

CIVIL ENGINEERING.

Professors Porter and Lyle and Messrs. Spengler, Lohr, and Williams.

601. SURVEYING.—Chain, compass and transit surveying. Leveling. Drafting. Text-book—Breed and Hosmer's Plane Surveying. Third term, Freshman year. Two periods per week.

602. SUMMER SCHOOL.—Field problems in use of chain, level and transit. Survey of College Campus. Map. Area Computations. Three weeks in vacation at end of Freshman year.

603. SURVEYING.—Stadia survey. Theory of trigonometric and barometric leveling. Plane-table, sextant and hydrographic surveying. Topographic drafting. Text-book—Breed and Hosmer's Higher Surveying. First term, Sophomore year. Two periods per week.

604. HIGHER SURVEYING.—Plane table, sextant and aneroid. Precise leveling, base line measurements, and solar observations for azimuth and latitude. Text-book—Breed and Hosmer's Higher Surveying. Third term, Junior year. Two periods per week.

611. RAILROADS.—Simple, reverse, compound, vertical and transition curves. Drafting. Text-book—Allen's Railroad Curves and Earthwork. Second term, Sophomore year. Two periods per week.

612. RAILROADS.—Turnouts, cross-overs. Paper location of railroad. Estimate of cost. Drafting. Field problems. Text-book—Allen's Railroad Curves and Earthwork. Third term, Sophomore year. Two periods per week.

613. SUMMER SCHOOL.—Railroad reconnaissance. Preliminary and final location. Cross-sectioning. Map. Three weeks in vacation at end of Sophomore year.

614. RAILROADS.—Computation of earthwork from notes of Summer School Survey. Problems in Earthwork. Mass diagrams. Drafting. Text-book—Allen's Railroad Curves and Earthwork. First term, Junior year. Three periods per week.

615. RAILROADS.—Economic location. Traffic. Operating ex-

penses. Cars and locomotives. Railroad structures. Text-book—Webb's Railroad Construction. Second term, Junior year. Two periods per week.

621. APPLIED MECHANICS. STATICS.—Principles of equilibrium and their application to flexible cords, tackle, jointed structures, friction, moment of inertia. KINEMATICS. Rectilinear motion, curvilinear motion, harmonic motion. Motion of a rigid body, translation, rotation, plane motion. Text-book—Maurer's Mechanics. Third term, Sophomore year. Four periods per week.

622. APPLIED MECHANICS. KINETICS.—Motion of a particle, translation of a rigid body, rotation, plane motion of a rigid body, work and energy, impulse and momentum. First term, Junior year. Four periods per week.

623. MECHANICS OF MATERIALS.—The principles of stress and strain; the behavior of materials under tension, compression and shearing; investigation and design of pipes, riveted joints, boilers and standpipes; strength and flexure of simple and cantilever beams. Report on the carrying capacity of a floor. Text-book—Merriman's Mechanics of Materials. First term, Junior year. Four periods per week.

624. MECHANICS OF MATERIALS.—Restrained and continuous beams; columns; shafts; reinforced concrete. Impact and fatigue; true and internal stresses; mathematical theory of elasticity. Design of an I-beam highway bridge and of a steel standpipe. Text-book—Merriman's Mechanics of Materials. Second term, Junior year. Four periods per week.

625. GENERAL TESTING LABORATORY.—Study and use of testing machines. Commercial tension tests of iron and steel. Modulus of elasticity in tension and compression. Shear tests of iron, steel and wood. First term, Junior year. Two periods per week.

626. GENERAL TESTING LABORATORY.—Transverse tests of cast iron and wood; modulus of elasticity of steel in bending; tests of wooden columns; torsion tests of iron and steel; calibration of testing machines; modulus of elasticity of concrete; reinforced concrete beams. Second term, Junior year. Two periods per week.

631. ROADS AND PAVEMENTS.—Location, construction and maintenance of town and country roads, city streets and pavements. Street cleaning. Text-book—Frost's The Art of Road Making. Second term, Junior year. Two periods per week.

632. ROAD MATERIAL LABORATORY.—Standard tests of paving brick; road metal; and petroleums, malthas, tars and asphalts. Second term, Junior year. One period per week.

641. MASONRY.—The requisites of stone, brick and cement; the different kinds of bonds; strength of stone, brick and concrete masonry; the construction of foundations, bridge piers, abutments, retaining walls, dams, culverts and arches. Text-book—Baker's Masonry. Third term, Junior year. Two periods per week.

642. MASONRY DESIGN.—Design of a dam, a bridge pier and an arch, using both graphical and numerical processes. Notes. First term, Senior year. Two periods per week.

651. CEMENT.—The study of raw materials; method of manufacture; meaning and interpretation of different physical tests; the sources of error in testing; the inspection and sampling of both Portland and Natural Cements. Visits to cement mills and sampling and testing of a shipment of cement. Text-book—Taylor's Practical Cement Testing. First term, Junior year. Two periods per week.

652. CONCRETE, PLAIN.—Materials for concrete; proportioning and mixing; strength of plain concrete in compression, tension and flexure; the expansion and contraction of concrete; fire resistance of concrete; action of salt water on concrete as a protection to metal; adhesion of concrete to steel and iron; a short discussion of the different systems of reinforcing. Second term, Junior year. Two periods per week.

653. CONCRETE, REINFORCED.—Properties of the materials, general theory, relation of stress intensities on concrete and steel. Varieties of flexure formulas. Shearing stresses, bond stresses, working stresses and construction details. The preparation and use of diagrams and tables. The complete design of a reinforced concrete floor. Text-book—Turneaure

and Maurer's Reinforced Concrete. Third term, Junior year. Two periods per week.

654. Cement Laboratory.—Tests of Portland and Natural Cements are made in accordance with standard methods and specifications, the aim being to have the student become thoroughly acquainted with each standard test and understand and appreciate the significance of the results obtained. Special tests are made to show the effect of varying from standard methods. First term, Junior year. Two periods per week.

655. Concrete Laboratory.—Mechanical analysis of the materials for concrete; proportioning and mixing; preparation of concrete specimens for future tests. Second term, Junior year. Two periods per week.

656. Reinforced Concrete Laboratory.—Tests on plain concrete specimens to determine the stress deformation curve in tension and compression. Modulus of elasticity. Tests on reinforced beams to determine deflection and fiber stress distribution, location of neutral axis, and compression of actual results with those given by various formulas. Third term, Junior year. Two periods per week.

661. Hydraulics.—Hydrostatics, hydraulic instruments, orifices, weirs and tubes. Text-book—Merriman's Hydraulics. Third term, Junior year. Three periods per week.

662. Hydraulics.—Pipes, conduits; rivers; water power; dynamics; overshot, undershot and breast wheels; impulse wheels; turbines. Text-book—Merriman's Hydraulics. First term, Senior year. Three periods per week.

663. Hydraulic Laboratory.—Tests are made on the circular orifice, the Venturi meter, water meters and weirs. Third term, Junior year. One period per week.

664. Hydraulic Field Work.—Measurements of the flow of a stream by use of the current meter. Notes. First term, Senior year. Two afternoons.

671. Sewerage.—The disposal of sewage and garbage. The determination of the size and capacity of sewers, inlets and

flush tanks. Construction methods. Text-book—Folwell's Sewerage. First term, Senior year. Two periods per week.

672. SEWERAGE DESIGN.—Design of a sewer system for a small city with map and profiles. Notes. Second term, Senior year. Two periods per week.

681. WATER SUPPLY.—The requisites for a good water; the available sources of supply; the construction of pumping plants, reservoirs and pipes line; purification of water and its distribution to the public. Text-book—Turneaure and Russell's Public Water Supplies. Second term, Senior year. Two periods per week.

682. WATER SUPPLY DESIGN.—Design of a water-supply system for a small city. Notes. Third term, Senior year. Two periods per week.

683. PARK ENGINEERING.—Lectures on the engineering work involved in park and parkway development. Preliminary surveys; the acquisition of lands; topographical surveys for the use of the landscape architect; the letting of contracts; the preliminary operations of the contractor; drainage and sewerage; grading by hand, excavator, dredge and steam-shovel; pile driving; masonry walls and steps; water-supply systems; paths and drives; lighting. Second term, Senior year. One period per week.

690. FRAMED STRUCTURES.—The theory and computation of stresses in simple roof and bridge trusses and towers, under dead, live and wind loads. Notes. Third term, Junior year. Two periods per week.

691. ROOFS AND BRIDGES.—The theory and computation of stresses in simple roof and bridge trusses and towers, under dead, live and wind loads. Railroad bridges under locomotive wheel, excess and equivalent loads. Stress sheets. Notes. First term, Senior year. Two periods per week.

692. ROOFS AND BRIDGES.—The theory and computation of stresses in continuous, partially continuous, draw and cantilever trusses. Notes. Second term, Senior year. Six periods per week.

693. ROOFS AND BRIDGES.—The theory and computation of

stresses in suspension bridges and three-hinged arches. Notes. Third term, Senior year. Five periods per week.

694. Roof Design.—Complete computations and design drawing for a wooden roof truss with bill of materials and cost sheet. Notes. First term, Senior year. One period per week.

695. Bridge Design.—Complete computations and design drawing of a plate girder for railroad purposes, in accordance with standard specifications. Bill of materials, weights and estimate of cost. Notes. Second term, Senior year. Two periods per week.

696. Bridge Design.—Complete computations and design drawing of a through pin-connected railroad bridge in accordance with standard specifications. Bill of materials, weights and estimate of cost. Notes. Third term, Senior year. Five periods per week.

697. Bridge Erection.—Designing of false work. Erection of a full-weight pin-connected truss bridge. Third term, Senior year. Two days.

698. Graphic Statics.—Analysis of stresses by the force and equilibrium polygon to the discussion of beams and girders. Analysis of stresses in roof and bridge trusses. Notes. First term, Senior year. One period per week.

699. Thesis.—A thesis is required of every student as a condition of graduation, upon a subject appropriate to and approved by the Department. All laboratories and other apparatus belonging to the Department may be used for thesis purposes. Third term, Senior year. Two periods per week.

MINING ENGINEERING.

Professor Marquard and Mr. Hatch.

701. Mine Surveying.—Instruments. Stations. Underground traversing. Method of connecting surface and underground surveys. Use of top, side and solar telescopes. Mapping. Mineral land claims. Problems. First term, Junior year. Two periods per week.

706. Prospecting.—Physical characteristics of deposits. Geo-

logical indications. Prospecting for placer, vein and bedded deposits. Preliminary workings. Sampling. Examination. Valuation. Location of mineral claims. Second term, Junior year. Two periods per week.

711. DEEP BORING.—Use and location of bore holes. Rod boring. American system of cable drilling. Diamond drilling. Davis-Calyx, Matther-Platt, and Kind's systems of drilling. Survey of bore holes. Shaft sinking by boring. Third term, Junior year. One period per week.

716. BLASTING AND QUARRYING.—Explosives. Black powder, nitroglycerine, and its compounds; other high explosives and their use. Tools for boring blast holes, and the amount of charge. Firing by squib, and electricity. Slate, cement and stone quarrying. Third term, Junior year. One period per week.

721. SHAFT SINKING, DRIFTING, TUNNELING.—Shaft excavation and timbering. Location. Alignment. Level stations in the shaft. Special sinking methods; piling drums, freezing process, Triger's method, Kind-Cauldron system. Lippman's system. Tunneling methods in hard and soft rock. Systems of tunneling. First term, Senior year. Two periods per week.

726. EXPLOITATION.—Open cut work. Hydraulic mining. Gold dredging. Coal mining methods. Metal mining methods. Stoping methods. Slicing, caving, filling, block caving, room and pillar methods of mining ore. Methods of mine development. Maps to illustrate. Salt mining. First term, Senior year. Two periods per week.

731. TRANSPORTATION.—Arrangements for loading and unloading cars and bins on surface and underground. Underground haulage: animal, electric, rope, steam, and air. Self-acting planes. Hoisting drums, brakes, motors, ropes, guides. Safety appliances. Signals. Second term, Senior year. Two periods per week.

736. VENTILATION AND LIGHTING.—Air in mines. Mine gases. Testing air. Analysis of mine gases. Natural, furnace ventilation. Positive blowers. Centrifugal fans. Theory and efficiency of fans. Measurement and control of air currents.

Resistance of air ways. Explosions. Laws. Method of lighting. Safety lamps, electric lights. Laws. Second term, Senior year. Three periods per week.

741 MINE DRAINAGE.—Source and action of mine waters. Mine pumps. Water column pipes. Dams. Hoisting buckets. Drainage tunnels. Siphons. Operation of pumps by electricity and compressed air. Theory and efficiency of centrifugal pumps. Third term, Senior year. Three periods per week.

746. MINE CONSTRUCTION.—Study of stresses in beams, columns and girders by graphic statics. Design of a mine gangway set. Shaft timbering. Square set timbering methods. Design of flumes and trestles. First term, Senior year. Two periods per week.

747. MINE CONSTRUCTION.—Masonry, foundations, retaining walls. Stresses in trusses by graphic statics. Design of a roof truss. Second term, Senior year. Two periods per week.

748. MINE CONSTRUCTION.—Design of ore bins, head frame, tipples, and mill buildings. Third term, Senior year. Two periods per week.

751. ORE DRESSING.—Hand picking. Principle of crushing, and concentration. Crushers: jaw and gyratory, rolls, stamps, Huntington mill, Chilean mill, arastras. Classifying machinery: trommels, grizzlies, shaking screens, hydraulic classifiers, settling ponds, spitzkastens. Concentrating machinery: jigs with theory of jigging, vanners, tables, magnetic concentrators, amalgamation. Third term, Senior year. Four periods per week.

756. MINE MACHINERY.—Coal cutters, drills, hoists, cableways, motors, blast firers, air compressors. Theory of air compression and method of using and conducting compressed air. Third term, Senior year. Two periods per week.

761. MINE ADMINISTRATION.—Organization, administration and management. Mine accounts and cost keeping. Third term, Senior year. Two periods per week.

766. MINING LAW.—Review of the mining laws of the various countries. General principles of real estate law with respect

to minerals. United States mining laws. State laws and local regulations. Third term, Senior year. Two periods per week.

771. THESIS.—A graduating thesis is required of each candidate for a degree. This thesis must be an original design or review of some process, machinery or plant related to mining operations. The subject of the thesis is assigned by the department along lines of special interest to the student.

ELECTRICAL ENGINEERING.

Professor Rood and Mr. Higgins.

804. ELEMENTS OF ELECTRICAL ENGINEERING.—A special course designed for students in Civil, Mechanical and Mining Engineering. Elective for General Scientific and Latin Scientific students. Electricity and magnetism; electrical measurements; electrical illuminants; lighting systems; dynamos; motors; alternating current machinery; transformers. First term, Junior year. Three periods per week.

806. ELECTRICAL PROBLEMS.—Solution of elementary problems relating to direct current engineering. First term, Junior year. Two periods per week.

807. ELECTRICAL PROBLEMS.—A continuation of 806. Solution of problems relating to more advanced direct current engineering and to elementary alternating current engineering. Second term, Junior year. Two periods per week.

811. ALTERNATING CURRENTS.—Fundamental principles governing circuits having a variable E. M. F.; effect of resistance, inductance and capacity; generalized Ohm's law. First term, Junior year. Four periods per week.

812. ALTERNATING CURRENTS.—A continuation of 811. Alternator regulation; single, two- and three-phase circuits; measurement of power in polyphase circuits; theory of the transformer, single and polyphase transformers; methods of phase transformation. Second term, Junior year. Three periods per week.

814. ALTERNATING CURRENT CIRCUITS.—An advanced consideration of alternating current circuits; Fourrier's series and its

application to A. C. circuits; wave form; wave and vector discussion and analysis; application and use of the complex notation. First term, Senior year. Five periods per week.

821. ELECTRICAL LABORATORY.—Introduction to Laboratory methods and practice; measurements of resistance by drop method; insulation test; magnetic leakage; fuses; voltmeter and ammeter calibration by various methods; recording meters. First term, Junior year. Two periods per week, reports.

822. ELECTRICAL LABORATORY.—A continuation of 821. Tests upon arc and incandescent lamps; photometry; magnetization and characteristic curves of dynamos; tests of armature reactions. Second term, Junior year. Two periods per week, reports.

823. ELECTRICAL LABORATORY.—A continuation of 822. Parallel running of generators; investigation of commutator losses; elementary tests with alternating currents; effects of inductance and capacity. Third term, Junior year. Two periods per week, reports.

824. ELECTRICAL LABORATORY.—Motor and dynamo characteristics, A. C. wave form; magnetization and characteristic curves of alternating current generators, efficiency and regulation tests of transformers. First term, Senior year. Two periods per week, reports.

825. ELECTRICAL LABORATORY.—A continuation of 824. Tests of induction and synchronous motors; transformer groupings and resultant ratios; phase transformation; power transmission; transmission losses and efficiencies. Second term. Senior year. Two periods per week, reports.

826. ELECTRICAL LABORATORY.—A continuation of 825. Motor-generator tests; investigation of the rotary converter and its losses and characteristics; dielectric strength of insulating materials; resonance; the oscillograph. Third term, Senior year. Two periods per week, reports.

827. ELECTRICAL LABORATORY.—A special laboratory course designed for students in Civil, Mechanical and Mining Engineering. Elective for General Scientific and Latin Scientific students.

Fundamental experiments in calibrations, photometry, direct current generator characteristics. Second term, Junior year. Two periods per week.

828. ELECTRICAL LABORATORY.—A continuation of 827. Motor characteristics, motor and dynamo efficiencies, alternating current motor and transformer tests. Third term, Junior year. Two periods per week.

831. ENGINEERING ABSTRACTS.—The review and discussion of articles and papers of value in current engineering literature. Throughout Junior and Senior years. One period per week.

841. ELECTRICAL DESIGN.—The design and calculation of rheostats, controllers, wiring systems and machines. First term, Senior year. Two periods per week.

842. ELECTRICAL DESIGN.—A continuation of 851. Design and calculation of advanced types of electrical machinery, generators, motors and transformers. Second term, Senior year. Two periods per week.

851. MOTOR ENGINEERING.—A detailed consideration and comparison of the various types of constant and multi-speed direct and alternating current motors, their control, proper fields of use; types and methods of machine drives; power requirements of various commercial processes. Third term, Junior year. Four periods per week.

852. ILLUMINATING ENGINEERING.—A review and close study of the modern type of illuminants, gas and electric; photometry and standards of light; candle power distribution; effective illumination; reflectors, shades and globes, their effects and losses; location of lights; wall reflection and absorption. Third term, Junior year. Four periods per week.

853. ELECTRIC RAILROADS.—Systems of distribution; rail-bonds and bond testing; electrolysis; direct current motors and controllers; single-phase commutator motors, train operation and control, speed-time curves. Third term, Senior year. Five periods per week.

861. ELECTRIC POWER TRANSMISSION.—Low potential direct and alternating current distributing systems; calculation of losses and drop; house and factory wiring and systems; fire hazards

and their prevention; high potential lines, their construction and maintenance; lines and line losses. First term, Senior year. Four periods per week.

871. ELECTRIC POWER STATIONS.—A study of the considerations affecting the selection, erection and maintenance of steam and electric power plant machinery, and the assembling of such a machinery to form an economical plant for the production of electric power and light. Second term, Senior year. Four periods per week.

872. HYDRO-ELECTRIC ENGINEERING.—The fundamental principles of hydroelectric engineering; types, and forms of powerhouses; the types, proper selection and erection of turbines and governors, generating, switching and transmission apparatus. Second term, Senior year. Three periods per week.

881. THE TELEPHONE.—A study of all the modern telephone systems with a review of the earlier systems and development. Third term, Senior year. Five periods per week.

891. THESIS.—A thesis is required of every student as a condition for graduation, the topic assigned or approved by the head of the Department. The thesis must show the result of individual investigation and research.

CHEMISTRY AND METALLURGY.

Professors Hart and Wysor and Messrs. DeLong, Taylor and Grinslade.

901. ELEMENTARY DESCRIPTIVE INORGANIC CHEMISTRY.—Brief course in the chemistry of the non-metals and metals comprising lectures, preparatory work, and recitations. Third term, Sophomore year. Two periods per week.

902–3–4. QUALITATIVE ANALYSIS AND QUANTITATIVE ANALYSIS (Begun).—First, second and third terms, Junior or Senior year. Two periods per week.

905–6–7. QUANTITATIVE ANALYSIS.—Elective Course: The work of which is varied to meet the requirements of the student. First, second and third terms, Senior year. Two periods per week.

911. DESCRIPTIVE INORGANIC CHEMISTRY.—Lectures, quizzes and

laboratory work. First term, Freshman year. Four periods per week.

912. ADVANCED INORGANIC CHEMISTRY.—The law of gases. The chemical balance. Diffusion and dissociation. Principles of quantitative analysis. Recitations and laboratory work. Second term, Freshman year. Two periods per week.

913. QUALITATIVE ANALYSIS (Begun).—Third term, Freshman year. Four periods per week.

914. QUALITATIVE ANALYSIS (Continued).—First term, Sophomore year. Four periods per week.

915. QUALITATIVE ANALYSIS (Completed).—Second term, Sophomore year. Four periods per week.

916. QUANTITATIVE ANALYSIS (Begun).—Third term, Sophomore year. Four periods per week.

917. CHEMICAL ARITHMETIC.—Third term, Sophomore year. Four periods per week.

918. QUANTITATIVE ANALYSIS (Continued).—First term, Junior year. Five periods per week.

919. THEORETICAL CHEMISTRY including special determination in the laboratory.—First term, Junior year. Two periods per week.

920. ORGANIC CHEMISTRY (Begun).—Laboratory work. First term, Junior year. Four periods per week.

921. ORGANIC CHEMISTRY (Continued).—Lectures, recitations and laboratory work. Second term, Junior year. Four periods per week.

922. ORGANIC CHEMISTRY (Completed).—Third term, Junior year. Four hours per week.

924. THEORETICAL CHEMISTRY (Continued).—Second term, Junior year. Two periods per week.

925. THEORETICAL CHEMISTRY (Completed).—Third term, Junior year. Two periods per week.

926. QUALITATIVE ANALYSIS (Begun) (Shorter Course).—Second term, Freshman year. Two periods per week.

927. QUALITATIVE ANALYSIS (Completed) (Shorter Course).—Third term, Freshman year. Two periods per week.

928. QUANTITATIVE ANALYSIS (Begun) (Shorter Course).—First term, Sophomore year. Two periods per week.

929. QUANTITATIVE ANALYSIS (Continued) (Shorter Course).—Second term, Sophomore year. Two periods per week.

930. QUANTITATIVE ANALYSIS (Completed) (Shorter Course).—Third term, Sophomore year. Two periods per week.

931. QUANTITATIVE ANALYSIS (Continued).—Second term, Junior year. Five periods per week.

932. QUANTITATIVE ANALYSIS (Continued).—Third term, Junior year. Four periods per week.

933. QUANTITATIVE ANALYSIS (Continued).—First term, Senior year. Ten periods per week.

934. CHEMICAL ENGINEERING.—The Elements of Chemical Engineering. First term, Senior year. Two periods per week.

935. CHEMICAL TECHNOLOGY.—Manufacture of "heavy chemicals." Second term, Senior year. Two periods per week.

951. METALLURGY.—Properties of Metals. Refractory materials and fluxes; furnaces; fuels and thermo measurements; ore dressing; iron and steel. First term, Junior year. Two periods per week.

952. METALLURGY.—Lectures, recitation and laboratory. Second term, Junior year. Two periods per week.

953. METALLURGICAL CHEMISTRY.—Elective. First term, Senior year. Two periods per week.

954. METALLURGICAL CHEMISTRY (Continued).—Elective. Second term, Senior year. Two periods per week.

955. ASSAYING.—Second term, Senior year. Two periods per week.

961–2–3. TECHNICAL GERMAN.—Translation of Chemical works from the German. First, second and third terms, Junior year. One period per week.

964–5–6. TECHNICAL GERMAN (Continued).—First, second and third terms, Senior year. One period per week.

971. THESIS WORK.—Second term, Senior year. Six periods per week.

972. THESIS WORK (Completed).—Third term, Senior year. Twelve periods per week.

973. AGRICULTURAL CHEMISTRY (optional).—Second term, Senior year. One period per week.

974. LEAD BURNING (optional).—Second term, Senior year. One period per week

MECHANICAL ENGINEERING.

Professor Fitch and Messrs. Rounds and Haslam.

1001. WOODWORKING AND PATTERN MAKING.—Use and care of hand tools and woodworking machinery. The *Bench Work* (about five weeks) consists in the making of various joints used in mill construction and framing; *Woodturning* (about two weeks), the use of the lathe and turning chisels with exercises illustrating methods of holding different kinds of work; *Pattern Making* (the rest of the term), the construction of patterns, involving shrinkage, draft, fillets, finish, coreprints, coreboxes, etc. First term, Sophomore year. Two periods per week.

1002. FOUNDRY.—The tempering of sand, and making of moulds from various types of patterns, and cores to go with them. At least one casting of lead to familiarize the student with the process, then pours of brass and iron. Instruction is also given in preparing, charging, and operating a cupola; and special methods such as sweep moulds, etc. Second term, Sophomore year (about four weeks). Two periods per week.

1003. FORGING.—Drawing, upsetting, welding, and forming of iron including the use of swedges, etc. Annealing, hardening, tempering of steels, and tool making. Second term, Sophomore year (about five weeks). Two periods per week.

1004. MACHINE SHOP. BENCH WORK.—The use of cold chisels and files for working to size and finishing; and hand scrapers for producing flat surfaces. Lathes: Exercises giving outside and inside turning including taper turning, threads, chuck and face plate work. Shaper and Planer: Exercises giving planing to surface showing various methods of setting up work.

Milling Machines: Exercises giving general milling work, gear cutting, and the making of reamers, cutters, and taps. Universal Grinder: Exercises giving internal, cylindrical, surface, and cutter grinding. Radial Drill: Exercises giving drilling to layout. The use of small tools giving the student a knowledge of proper methods of laying out, and setting up work in the machines. Selection and sharpening of tools, proper cuts, speeds, and feeds for different tool steels on different metals is taken up under the guidance of the instructor. As much of this work as is practicable is given the third term, Sophomore year, and is continued in the Junior year for students in the Mechanical and Electrical Engineering Courses.

1005. REPAIRING.—Students are required, under instruction, to install new machinery, to repair and adjust broken apparatus, to make jigs, fixtures, etc., for use of the Department. Third term, Junior year. Two periods per week.

1011. MECHANISM.—The study of the motions and forms of mechanisms occurring in machines, also the study of mechanisms found in modern machine tools. The course also includes the design of gear teeth, the theory and practice of designing valve gears and governors for steam engines. Three terms, Sophomore year. Two periods per week.

1012. MACHINE DESIGN.—The designing of derricks, cranes, hoists, and conveying machinery, involving gears, pulleys, cables, chains, etc., and special study of friction. (Lectures and drafting room.) First term, Senior year. Three periods per week.

1013. STEAM ENGINE DESIGN.—The study in detail of various types of engine valves, and governors. The complete design of an engine—all of the necessary computations, detail and assembly drawings. (Lectures and drafting room.) Second term, Senior year. Three periods per week.

1014. POWER PLANT DESIGN.—The study of the various phases of steam and hydraulic power plants. The student is given data for an actual proposition, and is required to make a careful study of all the details, and then draw up a consulting engineer's report, bringing out clearly the proposed scheme of development, estimated cost, and probable returns to the promoter. Upon the acceptance of this report, the design is undertaken. The building, arrangement of machinery, piping, etc., are worked out in detail, and complete drawings made. (Lectures and drafting room.) Third term, Senior year. Three periods per week.

1021. BOILERS.—The study of the various types of steam boilers, and their auxiliaries, and the accessories of a steam plant. Some drawing work is given in connection with this course in order that the student may become more familiar with the construction and details of steam boilers. First and second terms Junior year. Two periods per week.

1022. TURBINES.—A study of the various types of turbines and their auxiliaries, and their application to power problems. First term, Senior year. Two periods per week.

1023. STEAM ENGINEERING.—Primarily a descriptive course dealing with the selection, adjustment, care and repair of various types of engines, turbines, boilers, pumps, and all accessories. Higher mathematics and theory is reduced to a minimum, for the object of this course is not to teach the design of steam apparatus, but the intelligent operation of same. (Lectures and recitations.) Second and third terms, Junior year. Three and two periods per week.

1024. THERMODYNAMICS.—The theory of heat, and its applications to engineering. Perfect gases, steam, hot air engines, steam engines, turbines, injectors, refrigerating machines. (Lectures and recitations.) First term, Senior year. Three periods per week.

1031. MECHANICAL ENGINEERING LABORATORY.—Experiments with engines, pumps, injectors, condensers, and steam power plant apparatus, with special reference to the power derived, steam consumption, setting of valves, and general operating conditions. (Laboratory and reports.) Third term, Junior year, and first, second and third terms, Senior year. One period per week.

1041. GAS ENGINES.—A study of the types of engines, their fuels and accessories, gas producers, etc. Third term, Junior year. Two periods per week.

1051. HEATING AND VENTILATING.—Heating of buildings by hot air—natural draft and forced; hot water, and steam—direct and indirect radiation. Ventilation of buildings. Computations and sketches for assigned problems. (Lectures and recitations.) Third term, Senior year. Three periods per week.

1052. REFRIGERATION.—A study of the principles of the mechanical production of heat, the physical properties of the different refrigerants, a description of the various types of refrigerating machines, and a discussion of actual problems. Second term, Senior year. Three periods per week.

1061. INDUSTRIAL MANAGEMENT.—A study of piece work and flat rates; time and cost keeping; organization of working force, location of factories, production of product; contracts, specifications, etc. (Lectures and recitations.) Third term, Senior year. Three periods per week.

1071. ABSTRACTS.—The preparation of a paper by each student on some technical subject, approved by the Department. These papers to be read before the class and discussed. Second term, Senior year. Two periods per week.

1072. THESIS.—A thesis is required of every student as a condition of graduation. The subject may be chosen by the student, but it must be approved by the Department. The shops, laboratories, and all apparatus belonging to the Department may be used for this work. Third term, Senior year. Two periods per week.

GENERAL INFORMATION.

ATTENDANCE.

Attendance on all college exercises is strictly required. Absences on account of sickness, or for other satisfactory cause, may be excused, and leave of absence will be granted at the request of parents when absolutely necessary. In such cases the absence is excused, but the student is invariably required to make up such work as he may lose by reason of his absence. Reports are sent to parents whenever the absences of their sons exceed a reasonable number. In case of the absences becoming excessive the faculty will punish the neglect with suspension. Absences incurred at the beginning and end of a term, especially if they involve absence from examinations, and immediately preceding and succeeding holidays, are regarded with special disapproval, and under ordinary circumstances will not be excused.

Each student is expected to have at least sixteen recitations each week. No student is permitted to take a course involving fewer hours of recitation without a special vote of the Faculty. Three hours of field or laboratory work are regarded as equivalent to one recitation period. The regular gymnasium drills are also regarded as required exercises as far as prescribed.

EXAMINATIONS.

Examinations are held at the close of each term on the studies of that term, and may be either written or oral, or both, at the option of the professor in charge. In addition to these regular examinations, partial examinations and written recitations are held from time to time during the term, with or without notice to the students. Failure to attend an examination, except for reasons of absolute necessity, is regarded as a serious delinquency, and will be dealt with according to the circumstances of each case.

STANDING.

The scholarship of students is determined by the results of the examinations and daily recitations combined.

Students entering with conditions are required to make them up before the end of the term next after that in which they enter.

Students failing to pass in the studies of any term are required to make up such studies before the beginning of the term after that in which the failure occurred, and they may be specially directed to do so at an earlier date. Students who do not comply with these regulations will be put on probation in scholarship, or lose standing and be only "permitted to recite," or be dropped into the next lower class, as the Faculty may in each case decide.

Reports of the standing of the students are made to their parents or guardians at the end of each term.

RULES GOVERNING ABSENCES AND RE-EXAMINATIONS.

1. No absence from a recitation, a lecture or a laboratory exercise shall be excused.

2. If the number of a student's absences in any term from the exercises in any subject exceed the number of exercises per week in the subject, but not double the number, he may, at the discretion of the instructor in charge, be debarred from the term examination

in the subject, provided the number of absences is not less than three.

If he be debarred, he must pass on the subject before the first day of the next term or repeat the subject with a following class.

3. If the number of a student's absences in any term from any subject exceed double the number of exercises per week in the subject, he must repeat the subject with a following class, provided that the number of such absences must exceed three.

4. If, for special reasons, the head of the department recommend it, the faculty may vote that a student who would otherwise be required to repeat a subject by Rule 3 be given one examination on the subject. If he fails in this examination, he must repeat the subject.

5. Before a student may take the examination provided for in Rule 4, he shall be required to pay to the treasurer of the college a fee of two dollars and show the treasurer's receipt for the same to the teacher in charge of the examination.

6. The instructor in charge of each subject shall, at the beginning of each week, post in some place easily accessible to the students interested, the number of absences from the exercises of the subject of each student to date.

7. All absences shall be reported weekly to the clerk of the faculty, who shall record them.

8. When the number of a student's unexcused and unpermitted absences from the religious and other exercises of the college reaches five, he shall be warned by his class dean; when it reaches ten, he shall be again warned; when it reaches fifteen, he and his parents shall be warned that he is in danger of being dropped from the college rolls; when it reaches twenty, he shall be dropped. If at the end of a term a student has twenty such absences he shall have five absences charged against him on the next term for every five or fraction of five absences above nineteen which stand against him.

PERMITTED ABSENCES.

9. In case of absence due to prolonged sickness or request from home for urgent reasons approved by the dean, the student shall, as soon after the absence as possible, present to the dean a written statement of the cause of his absence, after which the dean shall give the student an exact statement of the duration of his absence,

which he shall present to his instructors, each of whom shall indorse upon it the number of absences from his subject covered by it. The student shall then take it to the dean, and the absences indorsed upon it shall not be counted by the clerk in making up the number of Rule 8.

When such permitted absence causes the number of a student's absences in any subject to reach the number which would debar him from the examination, he shall be required to make up the work done by the class during as many of these absences as are required to bring his absences below the debarring number by an examination to be held within a month of the absences.

If he fail in this examination, he shall be debarred from the term examination and required to pass on the subject by a special examination to be held before the first day of the following term. If he fail in this special examination, he shall repeat the subject with a following class.

Before this special examination may be held, the student shall pay to the treasurer of the college a fee of two dollars, and shall show his receipt for the same to the instructor in charge of the examination.

The student shall be permitted to make up, by examination, all these permitted absences, in which case none of them shall be counted against him.

10. When permission to be absent from town has been given to a student by vote of the faculty or by the President acting for the faculty, such student shall receive from the dean an exact statement of the duration of such absence, which he shall present to his instructors, each of whom shall indorse upon it the number of absences from his subject covered by it. The student shall then return it to the dean and the absences indorsed upon it shall not be counted by the clerk in making up the number of Rule 8.

When such permitted absences shall cause the number of a student's absences in any subject to reach the number which would debar him from the examination, he shall be required to make up the work done during as many of these absences as are necessary to bring his absences below the debarring number by an examination held within a month of the absence.

If he fail in this examination he shall be debarred from the term examination and required to pass on the subject by a special examination to be held before the first day of the following term. If he fail in this special examination, he shall repeat the subject with a following class.

Before this special examination may be held, the student shall pay to the treasurer of the college a fee of two dollars and shall show his receipt for the same to the instructor in charge of the examination.

The student shall be permitted to make up, by examination, all these permitted absences, in which case none of them shall be counted against him.

11. If professors, in whose departments a student has the majority of his hours per week, report to the faculty that the student is neglecting his work, he and his parents shall be warned that he is in danger of being dropped from the college rolls. If a second such report be made, he shall be dropped.

RE-EXAMINATIONS.

1. A student who fails at the regular term examination in any subject shall be entitled to one re-examination.

2. If, for special reasons, the head of the department recommend it, the faculty may vote that a student who has failed in the re-examination provided for in Rule 1 may be given a second re-examination.

3. Before a student can take the second re-examination provided for in Rule 2, he shall be required to pay to the treasurer of the college a fee of two dollars and show the treasurer's receipt for the same to the instructor in charge of the examination.

4. If, at the beginning of the college year, a student has failed to pass on his conditions of the preceding year in the departments of Mathematics, Mechanics, Physics, French and German, and in Projections and Descriptive Geometry in the department of Graphics, he shall be required to repeat the subjects in which he is still conditioned.

5. When subjects, which closely depend upon each other, are continued throughout successive terms, the department interested may require that all conditions of any terms in those subjects shall be made up within two weeks from the beginning of the next term, in order that the student may go on with those subjects.

6. All students who have one or more conditions in Freshman

English at the end of the third term are required to take English with the incoming Freshman class and to remain in the course till they have satisfactorily passed off their conditions. No re-examinations are given in the course.

7. A student who fails in mathematics in any term of the Freshman year or in the first term of the Sophomore year shall report for re-examination at nine o'clock of the day preceding the first day of the next term and if he fails to make up his condition he shall take an extra class of two hours per week for one term in the subject in which he failed, said class to rank as a regular part of his schedule of study.

CONDITIONS.

1. A student who fails to complete satisfactorily the work prescribed in any subject is permitted to continue his studies upon *condition* that he make up the failure, or remove the condition, within a specified time.

2. Where no other time is fixed the condition must be removed before the beginning of the third term after that in which the failure occurred. If the condition is not made up before that time the student shall repeat the subject.

3. A student shall not be enrolled as a member of the Sophomore class who has any entrance conditions unless by vote of the faculty he be permitted to make up his deficiency by taking an equivalent amount of college work, in addition to his regular schedule, in satisfaction of the condition.

4. A student shall not be enrolled as a member of the Junior class who has any Freshman conditions, nor of the Senior class who has any Sophomore conditions, and all subjects prior to Senior year must be made up before the beginning of the second term of the Senior year in order that the student may be a candidate for a degree at Commencement of that year. A student who would otherwise be a candidate for a degree in that year may be permitted by vote of the faculty to remove conditions by repeating the subjects with a class, but not by a special examination.

5. A student who, at the opening of a college year, has overdue conditions representing more than twelve (12) hours of work shall fall back to the next class.

6. A student who, at the opening of a college year, has overdue

conditions representing sixteen (16) hours of work, whether he be a regular or a special student, shall be dropped from the college unless he can arrange to enter a lower class as a regular student with conditions aggregating less than eight hours of work.

NOTE:—By "hours of work" is meant the number of exercises scheduled in that subject for one term.

GRADUATION.

Students who have pursued an entire course as prescribed and have successfully passed their examinations are recommended to the trustees for the first academic degree in course. Such recommendations are ordinarily acted upon and the degrees are conferred at Commencement, at which time the students receive diplomas from the President of the College. At Commencement the faculty awards such honors as it sees fit to those who are to receive degrees. These honors ordinarily consist of a valedictory oration, a Latin salutatory, and other honorary orations and theses.

COMMENCEMENT.

The College year is so arranged as to provide a term of 14 weeks immediately before the Wednesday preceding Christmas day and two terms of 11 weeks each after the Christmas vacation, the vacation at Christmas and in the Spring being two weeks each. The annual Commencement usually falls on the third Wednesday in June but occasionally the fourth Wednesday. The three days immediately preceding Commencement day are set apart for special exercises. On Sunday, the first of these days, a Baccalaureate sermon is preached in the College chapel at eleven o'clock in the morning; and in the evening a sermon is preached in the auditorium of Pardee Hall before the Brainerd Society of the College by some distinguished minister selected by the Society. The preacher for 1912 was Rev. John B. Laird, D.D., of Frankford, Pa.

On Monday the Senior class holds its Class Day exercises on the campus.

The alumni and literary societies hold their reunions on Tuesday, and orations are delivered before the literary societies in the Society halls.

The regular Commencement exercises are held in the auditorium of Pardee Hall on Wednesday morning, the afternoon being occupied by the alumni dinner. All these exercises are open to the public. Various other exercises of an athletic or social nature are conducted on the part of the students under a general supervision by the faculty.

DEGREES.

THE FIRST DEGREE.—The degree of *Bachelor of Arts* is conferred on the graduates of the Classical Course; *Bachelor of Philosophy*, on those of the Latin Scientific Course; *Bachelor of Science*, on those of the General Scientific Course; *Bachelor of Science* (in Chemistry), on those of the Chemical Course; *Civil Engineer*, on those of the Civil Engineering Course; *Engineer of Mines*, on those of the Mining Engineering Course; *Electrical Engineer*, on those of the Electrical Engineering Course; *Mechanical Engineer*, on those of the Mechanical Engineering Course.

MASTER'S DEGREE.

MASTER OF ARTS.—The degree of *Master of Arts* may be conferred one year after graduation on any *Bachelor of Arts* who has pursued a prescribed course of study, equivalent to sixteen recitations per week, during one year in residence, passed the examinations, and presented a satisfactory thesis.

The same degree may be conferred two years after graduation on any *Bachelor of Arts* who shall have devoted at least one year exclusively to advanced study under the direction of the faculty;

BRAINERD HALL.

passed examinations in the studies pursued, and presented a satisfactory thesis.

Candidates for this degree must, in all cases, register on or before October 1st, and examinations must be held at the College at least once in each college term. Theses must be presented for approval not later than May 1st. A registration fee of $5 and tuition fee of $100 per annum for residents, and $45 per annum for non-residents, is exacted of all graduate students.

MASTER OF SCIENCE.—The degree of *Master of Science* may be conferred upon any graduate of the scientific department upon conditions similar to those prescribed for the degree of Master of Arts.

CERTIFICATES.

Students who have been admitted to any department of the College, and have passed satisfactory examinations therein, may obtain certificates of the work which they have done if they have been in attendance not less than one year.

MEDICAL TREATMENT.

Beginning with the college year 1913–14 a college physician will be provided for the benefit of the students and for the information of the college authorities and the parents of students in the case of serious sickness.

The regulations with regard to his attendance upon students are as follows:

The college physician shall make one call for diagnosis and prescription at the expense of the College. When called to see students at their rooms he shall make a report of the diagnosis, with a recommendation of the course to be followed, to the Dean of the Students within twenty-four hours.

For continued attendance students may make their own arrangement with the college physician or some other physician approved by the college authorities. All calls after the call for diagnosis and all office calls shall be at the expense of the students.

Announcement of the name of the college physician and further particulars will be made at the opening of the college year 1913–14.

RELIGIOUS INSTRUCTION.

The aim of Lafayette College is distinctly religious. Under the general direction of the Synod of Pennsylvania of the Presbyterian Church its instruction is in full sympathy with the doctrines of that body. At the same time religious instruction is carried on with a view to a broad and general development of Christian manhood within the lines of general acceptance among evangelical Christians, the points of agreement, rather than those of disagreement, being dwelt upon.

Prayers are held each morning in the chapel at 7.50 and religious services in the chapel Sunday mornings at 11 o'clock. All students are expected to attend these services. No exceptions will be made to this rule for morning prayers. Where there is some exceptional reason assigned by the parents, students will be permitted to attend one of the churches in Easton instead of the Sunday morning service. This permission will be granted only on request of parents and for sufficient reason.

Special sermons are preached before the College from time to time by distinguished ministers. The preachers for 1912 were: Rev. J. Wilbur Chapman, D.D., Jamaica, N. Y.; Rev. Robert N. Faulconer, West Chester, Pa.; Rev. J. Ritchie Smith, D.D., Harrisburg, Pa.; Rev. Washington R. Laird, Ph.D., West Chester, Pa.; Rev.

B. M. Neill, Secretary of The Pennsylvania Seaman's Friend Society; Rev. William P. Chalfant, D.D., Ching-chow-fu, China; Rev. Charles R. Erdman, Princeton, N. J.; Rev. W. Barnes Lower, D.D., Wyncote, Pa.; Rev. Francis E. Higgins, "Lumber-Jack Sky Pilot;" Rev. James I. Good, D.D., LL.D., Philadelphia, Pa.; Rev. Charles G. Watson, Columbus, Ohio; Rev. Robert H. Nassau, M.D., D.D., Ambler, Pa.; Rev. John B. Laird, D.D., Frankford, Pa.; Rev. James M. Ludlow, D.D., East Orange, N. J.; Rev. Wm. Nesbitt Chambers, D.D., Adana, Seria; Rev. William C. Alexander, D.D., Philadelphia, Pa.; Rev. Arthur Phillips, Beverly, N. J.; Rev. David S. Kennedy, D.D., Philadelphia, Pa.; Rev. Charles S. Stevens, Philadelphia, Pa.; Rev. I. Mench Chambers, Merchantville, N. J.; Rev. Robert H. Morris, D.D., Philadelphia, Pa.; Rev. Leighton W. Eckard, D.D., Philadelphia, Pa.; Rev. William E. Brooks, Allentown, Pa.; Rev. John Fox, D.D., LL.D., Secretary of the American Bible Society, New York City; Rev. Samuel A. Cornelius, D.D., Oil City, Pa.; Rev. Robert Mackenzie, D.D., LL.D., Secretary of the College Board of the Presbyterian Church; members of the faculty and local clergy.

The preacher for the Day of Prayer for Colleges, 1913, is Rev. John R. Davies, D.D., of the class of '81, pastor of the Bethlehem Presbyterian Church, Philadelphia.

Instruction in the Bible has always held a prominent part in the College, and a full account of the courses in Bible study will be found on pages 98–100.

LECTURES.

Special courses of lectures are given annually in connection with several departments and will be found under those departments. A more general course of a popular character is given each year.

TERMS AND VACATIONS.

The College year is divided into three terms, with intervening vacations, as given in the Calendar on page 6. All the classes are examined at the close of each term, and a report sent to the parents or guardian. Students are required to be present punctually at the beginning of each term, and are not allowed during term-time to be absent from town, except by written permission from the Dean.

The Wednesday before the third Thursday of October in each year is observed as Founders' Day, in memory of those who founded the College and of those who have since contributed to its usefulness. On Founders' Day, 1912, an address was delivered by Hon. William Renwick Riddell, LL.D., Justice of King's Bench Division, High Court of Justice, Toronto, Canada.

BUILDINGS, LABORATORIES, LIBRARIES.

The College grounds are situated upon the summit of a beautiful hill, overlooking the city of Easton. They are reached by a flight of stone steps, which ascend the bold front of the hill directly from the head of Third Street, or by electric cars, which skirt the face of the hill by a gradual incline. At the head of the steps stands the monument erected by the alumni association to their comrades who "died for the Union." The grounds contain about sixty acres terraced and laid out under the direction of Donald G. Mitchell. The buildings upon the campus are forty in number. The oldest of these is

SOUTH COLLEGE.

The central portion of this building was erected in 1833 and was the original college building. At later periods east and west wings were added and the whole building was thoroughly overhauled and modernized in 1909. It now contains a large part of the class and lecture rooms for the academic department, and the basement and first floor of the east wing have been fitted for a lecture room and laboratory for the Department of Mining Engineering.

The first and second floors of the west wings are occupied by the College Chapel. The remaining space in the main building and in the wings is devoted to dormitory rooms which have been thoroughly modernized, and every comfort afforded by modern plumbing and sanitary arrangements has been added.

The building has also been beautified by a portico on the south front and by many improvements in the general finish of the building.

The alterations have been intended to secure every needed improvement without altering the general effect of the building. The sentimental value of its historical place in the college life and thought have not been lost sight of.

PARDEE HALL.

The most commanding position on the campus is occupied by this building, the most conspicuous evidence of the liberality of the late Ario Pardee, which reached to every department of the college. Here the departments of civil, mining, and electrical engineering are supplied with thoroughly equipped laboratories and lecture rooms, and the museums of these departments, and of general geology, mineralogy, and natural history, are to be found. The Ward Library and the handsome rooms of the two literary societies are also in this building, and the central portion of the second and third floors of the main building contains a beautiful auditorium in which the Commencement exercises, lectures, and other public entertainments are held.

The Van Wickle Memorial Library.

The Van Wickle Library was dedicated on May 30, 1900. It has given to the College one of the most needed additions to its equipment. A beautiful building of Pompeian brick and terra cotta, thoroughly furnished with the most approved appliances for library work, it is at once a most beautiful and useful feature in the College's development. It contains a large reading room, in which the periodicals and books of most constant reference are to be found; a reference book department; a large room for the general storage of the library; librarian's room; and small rooms for special work.

The Library having grown to such proportions as to require additional storage room for books, Miss Marjorie R. Van Wickle, in January, 1911, presented to the College a sum sufficient to erect an addition to the Library, which is now completed. This addition contains book stacks sufficient for the storage of from ninety to one hundred thousand volumes. It is in the form of an extension to the north of the original building and was a part of the original plan. It will provide for the growth of the Library for many years to come and is a beautiful and valuable addition to the efficiency of the Library.

JENKS BIOLOGICAL HALL.

This building was erected in 1864–'65 by the late Barton H. Jenks, of Philadelphia. It was recently entirely remodeled.

THE GAYLEY LABORATORY OF CHEMISTRY AND METALLURGY,

completed in 1902, is occupied by the departments of chemistry and metallurgy. The building consists of three stories, and is constructed of Indiana stone, colonial brick, and gray terra cotta. It is fireproof, with steel and cement floors, and gives a thoroughly modern equipment to these departments. This building contains also the Henry W. Oliver Chemical and Metallurgical Library.

THE ASTRONOMICAL OBSERVATORY,

in addition to the Observatory proper, contains a lecture-room, with accommodations for the students in astronomy.

WEST COLLEGE

contains the lecture room for two generations used by Prof. Francis A. March, the great scholar and beloved teacher and now occupied by Prof. Francis A. March, Jr., and the offices of the registrar and treasurer of the College.

GYMNASIUM.

The importance of physical culture was early recognized by this College and a gymnasium was erected in 1884 and placed under the direction of a competent instructor. At the present time regular drills are required of the Freshmen four times a week. Optional training in general gymnastics and fencing offered to upperclassmen, and the students are encouraged to participate in such outdoor sports as their physical development fits them for.

The gymnasium is equipped with all the apparatus requisite to physical training, with lockers, bath and dressing-rooms. Before taking part in the gymnasium exercises, or the outdoor sports every student is given a thorough examination, and great care is taken to give each student such exercises as he needs and to avoid anything that would be injurious. In addition to the Director, one of the most able and experienced physicians of Easton acts as consulting physician, and requests for special work or exception from any prescribed work are passed on by the Director and the Consulting Physician. No excuses from the required drills will be granted except upon the recommendations of these officials. A fine athletic field adjoins the campus. It is admirably equipped for athletic contests. Four recent classes erected a commodious field house on it. Here the contests in football, baseball, and track athletics, in which the students have excelled, are held.

No student may take part in any public contest without written permission from his parents previously filed with the Dean.

The Dormitories.

A complete reorganization of the dormitory system was effected in the summer of 1900 by the building of central structures, known as Knox and Fayerweather Halls, to connect Blair and Newkirk Halls and Martien and Powell Halls respectively, and the facing of the completed buildings with mottled Pompeian brick, handsomely trimmed with red terra cotta. The archi-

VAN WICKLE MEMORIAL LIBRARY.

tectural beauty of the buildings is in marked contrast with the former appearance of the separate building. A complete sanitary plumbing system of baths, sinks, closets and electric lights has been installed in all the buildings. These improvements leave nothing to be desired for the health and comfort of the students.

Fraternity Houses.

Early in the current century the crowded condition of the dormitories made additional provision for rooms for the students imperative. To meet this need and to provide comfortable accommodations for their students, the fraternities represented in the College began the erection of a series of buildings, nearly all of which are situated on the College Grounds, which provide rooms and in most cases all of the conveniences of student life for the members of the various fraternities. There are now seven fraternity houses built upon a similar plan of providing accommodations for about eighteen students each. The buildings are a beautiful addition to the College equipment and are under the same supervision as the College Dormitories.

Infirmary.

A small building on McCartney Street immediately adjoining East College has been set apart for the use of students suffering from contagious diseases. This building has but rarely been called into service, but on several occasions has served to prevent the extension of contagion by the isolation of single cases of diphtheria and scarlet fever which have occurred. The building is intended exclusively for the use of students rooming in the college buildings. For non-contagious cases of a serious character, the excellent hospital of the city offers the best modern conditions of treatment.

BRAINERD HALL.

This building for the Y. M. C. A., the gift of J. Renwick Hogg, Esq., '78, of the Board of Trustees, was erected in 1902. It is a three-story gray stone building in the Tudor Gothic style. It contains a large room for the meetings of the society, and reading, writing, and committee rooms; also a trophy room of the athletic association, a room for the collection of curios from foreign missionary fields, and bowling-alleys in the basement.

Its object is to afford a home under active Christian influences for all forms of student life.

MECHANICAL LABORATORY AND SHOPS.

A building to contain the laboratories and shops of the Department of Mechanical Engineering is now completed.

This building is 102 feet by 185 feet, of steel and concrete construction, and contains on the main floor a wood-working shop 45 feet by 75 feet, a machine shop of the same dimensions, and a laboratory 45 feet by 150 feet, for steam and gas engineering. In the rear a forge shop and foundry 40 feet by 45 feet each, also boiler and storage rooms, lockers and lavatories.

This building is a part of a proposed plan of a complete set of engineering buildings to furnish better facilities to carry on the work of the four departments of engineering.

CENTRAL STEAM PLANT.

During the autumn of 1909 a central steam plant was established with a power house built of stone with a concrete roof containing large boiler and storage rooms with every convenience for the running of the plant. The power house is equipped with four 150-horse-power boilers which are sufficient for the present needs of the College and any probable additions for a considerable number of years to come. Provision is also made for the addition of an electric power plant whenever it shall be deemed desirable. This plant is now in full and successful operation and promises to be a great value to the College.

OTHER BUILDINGS.

The remaining buildings consist of a large GREENHOUSE, a useful adjunct to the department of botany, and also supplying flowers and plants for the adornment of the grounds in summer and of the buildings on public occasions. Besides these, a number of buildings are occupied as the HOMES OF THE MEMBERS OF THE FACULTY. The intimate relations resulting from the residence of both faculty and students upon the College grounds are regarded as one of the most wholesome features of the College life.

LIBRARIES AND READING-ROOM.

The main regular College Library occupies the Van Wickle Memorial Library, described previously. The College Library was established at the foundation of the College, and has had a steady and uninterrupted growth since 1832, and is chiefly made up of books bearing directly on the courses of instruction. The Ward Library, the gift of the heirs of C. L. Ward, Esq., of Towanda, is largely made up of books of general literature and history and political science. Each of the technical departments has also a collection of books, magazines, and other scientific publications in rooms in immediate connection with their lecture rooms and laboratories. By the gift of $5,000 Mr. Henry W. Oliver laid the foundation of the H. W. Oliver Chemical Library in the new Gayley Laboratory. The foundation has been added to by gifts from Prof. Edward Hart and others, and the incorporation of the College's collection of chemical works.

A friend of the College has bought and presented to the Henry W. Oliver Chemical and Metallurgical Library all the pamphlets, about three thousand in number, belonging to the library of the late Prof. Johannes Wislicenus, of the University of Leipsic.

The literary societies, also, have libraries numbering about 6,000 volumes, largely of a literary character, which valuably supplement the more solid libraries of the College.

The College Library contains a papyrus scroll, five feet long, from a mummy at Thebes, with a hieratic inscription—pronounced by Seyffarth the finest he has seen—presented by the late Hon. John Garrett, of Baltimore, of the class of '37, and a collection of prints and medals of General Lafayette presented by the late President William C. Cattell, D.D., LL.D.

There is also a full-length portraint of Lafayette, by Healey, presented by the late Dr. Thomas W. Evans, of Paris.

ALUMNI ALCOVE.—A collection of books and pamphlets written by the students, alumni, faculty and trustees of the College is being gathered and set apart as a "Lafayette Library" to represent the literary activities of the College. This unique and valuable collection now numbers about 400 volumes, and includes a full set of the College catalogues from 1832 to the present time, the Commencement addresses, and official publications of the College.

The LIBRARIES have received gifts, which are hereby gratefully acknowledged, from the following individuals and institutions:

Individuals:

Charles Albertson (2); Woodbury Blair (2); Carlos Bransby (5); Rev. John F. Dobbs (2); W. Gibson Field (2); A. C. Gaebelein (2); Frederic A. Godcharles (2); Rev. James I. Good, D.D.; Rev. F. G. Gotwald, D.D., (Pamphlet); Rev. Anson Rogers Graves; Prof. William S. Hall (2); Prof. Joseph J. Hardy; Prof. Edward Hart (44); Mrs. S. Q. Helfenstein; Clayton W. Holmes; Rev. H. E. Jackson; Charles F. Jenkins; M. H. Jones, Jr.; John W. Jordan (2); M. B. Lambert; George H. Lepper; A. S. Merrill; J. Pierpont Morgan; Robert H. Nassau; Prof. William B. Owen (5); A philanthropist (through Longmans, Green & Co.); William C. Ross; Arthur Searle; William Mackey Smith; Mrs. Harriet Prescott Spofford; Dr. Augustus H. Strong (2); Pres. Ethelbert D. Warfield (3); Ethan A. Weaver (27); Mrs. Laura Louise Ogden Whaling; Prof. Henry Wysor.

Firms and Institutions:

Bowdoin College; Bryn Mawr College; Carnegie Endowment for International Peace; Chemical Publishing Co. (4); Georgia Geological Survey; Germanistic Society of America; Lake Forest College (2); Lakeside Co.; Maryland Geological Survey (4); Massachusetts State Board of Health; Minnesota State Board of Health; National Academy of Sciences; National Association for the Advancement of Colored People; New York Society Library; Ohio State University; Pennsylvania Railroad Co. (2); Pennsylvania

Society of Colonial Governors; Prudential Insurance Co.; Royal Society of Canada; Union Theological Seminary; University of Pennsylvania.

Canadian Departments:

Department of Mines.

The class of 1871 has given to the College a fund, the proceeds of which are to be used for the purchase of the publications of the Early English Text Society. The library now contains a large and valuable collection of these.

The class of 1875 at its reunion in 1905 by the gift of one thousand dollars established an alcove in the library to be known as "The Francis A. March Alcove."

The class of 1892 at its decennial reunion in 1902 established an alcove in the library devoted to American literature. Two hundred volumes have been purchased and additions will be made from time to time.

SCIENTIFIC COLLECTIONS.

These are extensive and valuable, and are rapidly increasing from year to year by gifts from societies and individual donors, and by special appropriations in addition to the fees for registration and matriculation.

Among the most valuable of the collections may be mentioned the extensive herbarium, collected by Prof. Thomas C. Porter during forty years of enthusiastic labor; it is especially rich in North American plants and is believed to contain the most complete flora of Pennsylvania in existence and the series of Ward's celebrated casts, illustrating geology and palaeontology.

The apparatus in the department of physics and applied mechanics, the instruments used in the departments of astronomy and engineering, and the scientific equipment of the numerous and extensive laboratories meet the demands of advanced instruction in these departments; a special feature, however, is the series of nine hundred wall charts, executed at the College by Gustave Garnier, under the direction of the professors in the departments of astronomy, chemistry, physics and applied mechanics, metallurgy, and natural history. There are valuable models in machine drawing, stone cutting, crystallography, and architecture.

COLLEGE SOCIETIES.

LITERARY SOCIETIES.

The *Washington* and *Franklin* societies were organized early in the history of the College and are conducted by the undergraduates. Both societies have well-furnished apartments in Pardee Hall, and valuable libraries. They meet every Wednesday evening for literary exercises, consisting of orations, essays, and debates. A generous rivalry for College honors exists between them, and each year representatives of the two societies from the Junior class engage in a public contest in oratory. On the day before Commencement the societies hold reunion meetings in their halls. These societies are an important part in College life and work, and *all the students are strongly advised to join them.*

BRAINERD EVANGELICAL SOCIETY.

The *Brainerd Evangelical Society*, as a society of inquiry, meets each Thursday evening and on the first Friday of each month in the interest of missions, and for the promotion of Christian effort. Its public anniversary is held on Sabbath evening of Commencement week, at which time a sermon is preached usually by some former member of the Society. In 1912 the preacher was Rev. John B. Laird, D.D., '92, Frankford, Pa.

BIOLOGICAL SOCIETY.

The *Biological Society* is for the purpose of making its members intelligent concerning the important biological questions of the day, enabling them to appreciate the value of research in nature. The membership consists of those students of the three upper classes who are either prospective or present members of the classes in biology, and of such graduate students as are interested in the laws of life comprehended through the natural history sciences.

CHEMICAL CLUB.

A *Chemical Club* has been organized by the students, for reading and discussing papers contained in the current chemical magazines, and to listen to lectures from visiting chemists.

DEUTSCHER VEREIN.

Der Deutscher Verein is an organization of students and officers interested in the study of German language and literature, and of German life and culture. Meetings are held fortnightly on Friday. Advanced students and others who desire to keep up their knowledge of German are invited. The program consists chiefly of conversations, addresses and the singing of German songs.

CLASSICAL UNION.

The *Classical Union* is an association which aims to bring together the students of the culture courses and to promote the interests of classical study in the College. Lectures on important subjects are given from time to time by members of the faculty and by eminent scholars from other institutions.

ELECTRICAL ENGINEERING SOCIETY.

A Branch of the American Institute of Electrical Engineers has been organized by the students in the Department of Electrical Engineering. Meetings are held weekly. Papers are written, abstracts prepared and discussions held over important engineering projects or developments.

EXPENSES.

The annual College charges at present are $145, and the charges will be the same for all students entering before the first day of June, 1914. This amount is made up as follows:

Tuition	$100.00
General expenses	24.00
Library and Reading-room	15.00
Gymnasium	6.00

These fees are payable in three instalments at the beginning of each term.

Beginning with the college year 1914–15 and applying to all new students entering after June 1, 1914, the tuition in the courses of Engineering and Chemistry will be $150 per annum. The same charge will be exacted from students who are pursuing courses of study identical with the courses in the technical school, though not candidates for a technical degree. The reason for this increase in tuition is the great increase in the cost of education in the technical departments and the fact that other institutions of a like grade have already raised their fees to an equal or greater amount.

After June 1, 1914, the tuition will be payable one-half at the beginning of the first term, and one-fourth at the beginning of the second and third terms.

In addition to the above fees the following special fees are charged:

Entrance Fees.—Each student pays $5 when he is registered for examination on entering College, and $10 when he is matriculated, thirty days afterwards. These fees are appropriated in part to the increase of the scientific collections and apparatus. No fees are charged for diplomas.

Laboratories and Fees.—A fee is charged in each of the laboratories to meet the expenses incident to the work of the student. In the chemical laboratories the fee is based on the apparatus used and the chemicals consumed. In other laboratories a flat rate is charged based upon the average cost. These fees are payable at the beginning of the term.

A deposit of $1 is also made at the beginning of each term to pay for public damages, the unexpended balance of which is returned to the student at the end of the year.

Scholarships.—Aid is given to young men of ability, industry and character who are properly recommended to the College authorities. It is the object of all scholarships granted under this head to aid worthy young men and to attract especially desirable students to the College. Special consideration has always been given to the sons of ministers and of teachers, and to candidates for the Christian ministry. The aim, however, has not been to create a favored class but to recognize the generous support which the College has received and peculiar advantages which young men of unusual early training bring to the College. The amount of aid will depend upon the necessities of the applicant but in no case will exceed the amount of the tuition fees. Applications for aid should be made to the President as early as possible after the first of January of the year in which the student expects to enter. No aid is granted to students pursuing special or incomplete courses of study or to those who are not fully prepared to take advantage of the opportunities offered by the College.

Scholarships offered as prizes in certain schools will be under the same regulations as other aid. The endowed scholarships issued to individuals prior to the establishment of the Scientific Department will provide free tuition in the Classical or Latin Scientific Courses and one-half tuition in the Technical Courses.

BOARD, ROOMS, WASHING.

In all cases the place of boarding must be approved by the Faculty. The price of table board in clubs managed by the students at present averages from $4.00 to $5.00 per week. Board, including furnished room, in private families, is from $4.50 to $6 per week. Washing costs 40 cents per dozen pieces.

Unfurnished rooms in the College buildings rent for $8 to $33 a term; unfurnished rooms adjacent to the College premises for $12 to $16 a term, or furnished rooms for $15 to $30 a term.

The steam-heated dormitories are lighted by electricity, the cost of which to each of the occupants is $6 a year. The charge for heating is $12 a year for each occupant.

Students are expected to room in the College dormitories unless they receive permission to room elsewhere. If they do not occupy College rooms, they are subject to an assessment to meet the loss to the College for rooms left vacant. The reason for this is that the funds of the College have been invested in the dormitories in order to secure cheap and convenient lodgings for the students, and it is to the advantage of all that the buildings should be occupied, the income from the investment being essential to the work of the College, and the students being protected against exorbitant rents.

Information in regard to the selection of rooms can be had from Professor William T. Lyle, inspector of College buildings, the buildings being open for inspection during each term, and three days preceding the first day of each term. Rooms are assigned only to students who have been admitted to College, or who present full certificates from authorized schools, in the order of their application.

College Bills.—College bills must be paid in advance. No student is enrolled for any term until his bill is paid and a student may be dropped from the roll of the Faculty at any time upon notice from the Treasurer that his college bill is overdue and unpaid. It is the duty of every student to present himself at the office of the Treasurer at the opening of each term, see that his bill is correct and pay it. Those who wish their bills sent home may have them sent to their parent or guardian if prompt request is made after their bills have been examined and found correct. No bills will be sent home upon a general request, and any neglect of early attention to a college bill will forfeit the right to any extension that would otherwise be granted.

For the convenience of the students it is arranged that payments of the bills shall be made by the Seniors on the first Thursday of each term, by the Juniors on the first Friday, by the Sophomores on the first Saturday, and by the Freshmen on the first Monday. No student is regarded as regularly enrolled for any term until his bill is paid. He may be dropped from the roll for neglect of his bill at any time upon notice from the Treasurer to the faculty. Where it is impossible for a student to pay his bill when due, the Executive Committee has power to extend the payment for a period of not more than thirty days from the beginning of the term. Such extension will only be granted upon written request filed with the Treasurer within ten days after the beginning of each term, giving a satisfactory reason for the extension asked for. A penalty of ten per cent. will be added to every bill remaining unpaid after the expiration of thirty days. No student, whose bill is unpaid, shall be permitted to take the term examinations.

Students entering after the middle of the term shall pay one-half of the College charges for the term. Students obliged, on account of sickness, to leave before the middle of the term may have refunded to them one-half of the College charges for the term; no reduction will be made to those leaving for any other cause.

Annual Expenses.—Some money for books and other incidental expenses will be needed, but, with close economy, the total annual expenses—exclusive of clothing and traveling expenses—need not exceed $400, as will be seen from the following summary:

	Liberal.	Moderate.	Minimum.
General college expenses	$ 24 00	$ 24 00	$ 24 00
Charge for College reading rooms, gymnasiums, etc.	21 00	21 00	21 00
Board, 36 weeks, at $4.00 to $5.00	175 00	160 00	144 00
Rent of College-room, $24 to $99	99 00	49 00	24 00
Light and fuel	18 00	18 00	18 00
Washing	25 00	16 00	12 00
Tuition	100 00	100 00	100 00
Books and stationery	48 00	40 00	32 00
	$510 00	$428 00	$375 00

Laboratory fees and damage assessments, which vary in amount, must also be added, while the personal expenses for clothing, etc., must be estimated according to individual experience. The first year will be made more expensive by the fees for registration and matriculation, and furnishings for room; $300 will therefore be a small allowance.

Parents and guardians at a distance may deposit funds with some member of the faculty, who will pay particular attention to the pecuniary concerns of the student, settling his bills, and transmitting an account of the expenditure, for which services he will charge a commission. It is strongly recommended that parents furnish their sons with little beyond what will meet their necessary expenses.

BEQUEST AND DEVICES.

Each state has special statutory regulations in regard to wills, and it is most important that all testamentary papers be signed, witnessed, and executed in all other respects according to the laws of the state in which the testator resides. In all cases, however, the name of the corporation must be accurately given, as in the following forms:

I give, devise, and bequeath to "Lafayette College," in Easton, Pennsylvania, its successors and assigns forever, the sum of ....dollars, to be invested by said corporation in good real estate security, and the interest accruing therefrom to be applied to the support of the Professors in said College.

I, give, devise, and bequeath a certain lot situated, etc., to "Lafayette College," in Easton, Pennsylvania, and to their successors and assigns forever, for the uses and purposes of said College, according to the provisions of its charter.

PRIZES.

The following prizes are offered annually:

THE FRANCIS A. MARCH PRIZE IN ENGLISH.

A prize of thirty dollars in books was given from 1862 to 1881 by the late Rev. William C. Fowler, LL.D., of Durham, Connecticut, and since 1881 has been continued by Henry A. Potter, M.S., class of '77, of New York, under the title of "The Francis A. March Prize," upon the following conditions:

"A committee of at least three shall be chosen by the faculty to determine which student of the Senior class has made the greatest proficiency in English philology.

"The decision of the committee is to be made after attending an examination in some English classic, conducted by the professor in English, and after reading essays written by the several members of the class, which shall contain a discussion of the language of some English classic."

The subject in 1913 will be the works of Dickens.

THE ASTRONOMICAL PRIZE.

A prize of thirty dollars in gold is awarded to the student making the greatest progress in the study of astronomy in the Senior year.

MATHEMATICAL PRIZE.

Two prizes of the value of twenty dollars each are offered in the department of mathematics to those students of the Sophomore class, one in the Classical and general courses of the scientific department, and one in the technical departments, who shall have exhibited during the first two years of the course the greatest proficiency in the study of mathematics.

These prizes were founded, as was the astronomical prize above mentioned, in 1867, by Professor Traill Green, M.D., LL.D.

THE LOUNSBURY PRIZE IN CHAUCER.

A prize, consisting of books is given to that student of the Sophomore class who shall present the best essay upon some one of the works of Chaucer. This prize was given in 1896 by Thomas R. Lounsbury, professor of English at Yale University, and will be continued by friends of the College as the Lounsbury prize in Chaucer.

THE EARLY ENGLISH TEXT SOCIETY'S PRIZE.

A prize, consisting of books of the Early English Text Society, of London, is given to that student of the Sophomore class who shall, at the close of the Sophomore year, pass the best examination in "English before Chaucer." The examination is based upon selected texts announced from year to year, which in 1913 will be from the New Testament.

This prize was founded in 1871.

THE CLASS OF '83 PRIZE.

A prize of the value of fifteen dollars is annually awarded to that member of the Sophomore class who shall have attained the highest standing in his division of the class in Trench on the Study of Words.

This prize was founded by the class of 1883 at their graduation.

COLEMAN BIBLICAL PRIZE.

Prizes, each of the value of ten dollars, are awarded to those students of the Freshman class who have attained the highest standing in the several divisions of Biblical study in that year.

These prizes were founded by the Rev. Lyman Coleman, D.D., in 1880.

PRIZES IN ORATORY.

The Washington and Franklin literary societies appropriate one hundred dollars a year for prizes in oratory. Four contestants are chosen from each Hall to take part in the Junior Oratorical Contest, which is held in May. In the presence of a public audience three judges, approved by the faculty, hear the speakers and award the prizes. Their decision is based on the merits of the performances as to originality and force, with reference both to composition and delivery. The first prize is fifty dollars, the second prize thirty dollars, and the third prize twenty dollars.

CIVIL ENGINEERING PRIZE.

A prize of the value of fifty dollars, the gift of Carrol Phillips Bassett, C.E., Ph.D., of the class of 1883, is annually awarded to that member of the graduating class who presents the best graduating thesis and attains the highest standard of scholarship in the Civil Engineering Course.

THE PARK PRIZE IN LATIN.

A prize of fifteen dollars for the Latin Department has recently been founded by Mr. Samuel R. Park, A.M., '84. In 1913 it will be awarded, on the work of the second and third terms Freshman class, for excellence in Horace.

HISTORICAL ESSAY PRIZE.

A prize consisting of a copy of his work, "*The Marquis de Lafayette in the American Revolution*," is given annually by Charlemagne Tower, Jr., LL.D., of Philadelphia, to that member of the Senior class who shall, on or before the first day of October, present the best essay on some subject connected with the relations of *France and the United States*. The essays must not exceed three thousand works in length. The subject for the year 1913 is: "*The Value of the French Alliance in the American Revolution*."

THE CHEMICAL ESSAY PRIZES.

A prize of five dollars in books is awarded each term to that member of the Junior or Senior class who shall present the best term theme on some chemical subject.

THE GILBERT PRIZE IN OLD ENGLISH.

By the will of Howard Worcester Gilbert, who died in Chester County, March, 5, 1895, a bequest was left to the College, with the provision that a gold medal of the value of forty dollars should be awarded every two years to the student writing the best essay on the Old English Language and Literature, beginning with Beowulf, in the earliest Anglo-Saxon period, and extending down to the year 1070. Should the competitors be of equal merit, preference is to be given to residents of Pennsylvania.

The medal is an inch and three-fourths broad, three-sixteenths of an inch thick, and contains on its face a relief portrait of King Alfred with the date 871–901, surmounted by the Anglo-Saxon phrase, "Naes he gold hwaete." The reverse shows a garland encircled with the legend, "Howard Worcester Gilbert Old English Prize. Founded 1895." Space is left for the name of the recipient.

This prize will be awarded at the Commencement of 1914. It is open to competition of students of Anglo-Saxon in the graduate course of 1913–14. The essay must be handed in by May 1, 1914.

'85 PRIZE IN PHYSICS.

The class of 1885 founded a prize in 1897 in the sum of $500, the annual income of which is given to that member of the Junior class who attains the highest rank in the studies of physics.

THE BLOOMBERGH PRIZE.

The class of 1888, at its decennial reunion, subscribed the sum of $500, the annual income of which is awarded to that member of the Junior class who shall attain the greatest proficiency in the study of the French and German languages and their literatures.

THE JAMES ALEXANDER PETRIE PRIZE.

A prize of the annual value of $50 has been put at the disposal of the College as a memorial to the late James Alexander Petrie, M.D., of Phillipsburg, New Jersey. It will be awarded to that member of the Junior class who shall attain the greatest proficiency in the Department of Romance Languages.

THE B. F. BARGE GOLD MEDAL.

A prize of a gold medal of the value of $100 was founded by Benjamin F. Barge, Esq., of Mauch Chunk, Pa., to be awarded to that member of the Senior class who shall deliver the best oration in an annual contest to be held on Memorial Day, May 30th. The contestants, not more than six in number, are to be chosen by a committee of the faculty from those members of the Senior class, who shall hand in orations on or before May 1st upon topics assigned by the committee not later than March 25th of each year.

BARGE MATHEMATICAL PRIZES.

By the bequest of the late Benjamin F. Barge, Esq., of Mauch Chunk, three prizes have been established for excellence in mathematical studies. These prizes will be awarded to members of the Sophomore class for excellence in the solution of original problems.

THE R. B. YOUNGMAN GREEK PRIZE.

The class of 1884, at its vigintennial reunion, subscribed the sum of $500, the income of which is to be awarded to that member of the Sophomore class who shall attain the greatest proficiency in Greek.

THE NEW SHAKSPERE SOCIETY'S PRIZE.

A prize of books is awarded to that member of the Junior class who passes the best general examination upon Shakspere, his works, life, character, etc.

NOTE.—In all cases where a prize is awarded to an essay or oration the successful competitor must hand to the proper authority two typewritten copies of his production before receiving the prize, if he is requested to do so.

DEGREES CONFERRED.

HONORARY DEGREES.

June 19, 1912.

DOCTOR OF LAWS.—Rev. John Fox, D.D., '72, Secretary of American Bible Society, New York, N.Y.; Anna Jane McKeag, Ph.D., President of Wilson College, Chambersburg, Pa.

DOCTOR OF DIVINITY.—Rev. Melvin Fraser, '82, Foreign Missionary, Batanga, West Africa; Rev. William Parker Chalfant, '81, Foreign Missionary, Ching-chow-fu, China.

DOCTOR OF SCIENCE.—Harvey Washington Wiley, Ph.D., LL.D., Washington, D. C.

MASTER OF SCIENCE.—William J. Burd, M.D., '87, Belvidere, N. J.; Charles Duncan Fraser, New York, N. Y.

MASTER OF ARTS.—Samuel Eakin Shull, '82, Superintendent of Schools, Perth Amboy, N. J.

October 16, 1912.

DOCTOR OF LAWS.—William Renwick Riddell, Justice of King's Bench Division, High Court of Justice, Toronto, Canada; George Tener Oliver, United States Senator, Pittsburgh, Pa.

DOCTOR OF DIVINITY.—Rev. James Isaac Good, LL.D., '72, President of Reformed Board of Foreign Missions.

DEGREES IN COURSE.

June 19, 1912.

BACHELOR OF ARTS.—Edward Leslie Bacon, N. J.; Philip Lewis Cook, Pa.; Harold Fetter Grim, Pa.; Jonathan Parsons Greenleaf, N. Y.; Atcheson Laughlin Hench, Pa.; Donald Wilson Henry, Pa.; Wilmer Jacob Hindenach, Pa.; Marshal Hunt, N. J.; Michael Joseph Kasprzak, N. J.; Jacob Vanderbilt Koontz, Md.; John David Lindsay, Del.; Russell McCauley, Pa.; Kemper Grier McComb,

N. J.; Harry Clayton Murphy, Pa.; William Gayley Simpson, N. J.; Paul Morgan Thomas, O.; Charles Oliver Williamson, Pa.

BACHELOR OF PHILOSOPHY.—Harold Dumont Beatty, N. J.; William Everett Crater, Jr., Pa.; Herman Anson Dann, Pa.; William Franklin Dannehower, Jr., Pa.; David Davis, Pa.; William Francis Farrell, Pa.; Floyd Johnson Hann, N. J.; George Maurice Hohl, Pa.; Paul Schell Kantner, Pa.; Harry Aaron Lipson, N. J.; Irving Kennedy Lovett, N. J.; Walter Walbridge McComb, Pa.; Ambrose Frederick Melan, Pa.; John Thomas Owens, Pa.; Joseph Daniel Person, Pa.; Walter William Propst, Pa.; Irving Schwed, N. J.; John Lander Stewart, N. J.; Charles Edward Straub, Pa.; John Dorman West, N. J.; Maurice Cleveland Wilson, Pa.; George Rodgers Wood, Pa.

BACHELOR OF SCIENCE.—John Eilenberg Howell, N. J.; Merlin Joe Kilbury, N. Y.; Robert Legh Warren, Pa.

BACHELOR OF SCIENCE IN CHEMISTRY.—Charles Matthaei Addis, N. J.; Milton Oliver Cederquist, Pa.; Kenneth Cushing Grinslade, N. J.; Albert Ernest Hall, '05, Pa.; William Luther Raup, Jr., Pa.; Ernest William Roth, Pa.; Stanley Judson Thomas, Pa.

CIVIL ENGINEER.—Benjamin Ray Brown, Pa.; John Boyer Cline, N. J.; James Blair Easter, Pa.; William Vilas Hill, N. J.; Elmer Lyon Jones, Pa.; Edward Heller Maier, N. J.; Chester Arthur Murtaugh, Pa.; Marino Diaz Quinones, Cuba; Austin Hunsicker Reeves, N. J.; Victor Raymond Schmidt, Pa.; John Andrew Wilson, Jr., Pa.; Leon Harold Woolsey, N. Y.

MINING ENGINEER.—Walter Amberson Barnes, Pa.; Ross Herman Boas, Pa.; Ralph Waldo Brown, D. C.; George Edward McElroy, Pa.

ELECTRICAL ENGINEER.—Howard Livingstone Benson, D. C.; George R. Kaercher Day, Pa.; George Benjamin Fillmore, Pa.; Albert James Graham, Pa.; Robert Carter Howell, N. J.; Harold John Lockwood, N. J.; Robert Walton Mumma, Pa.

MASTER OF SCIENCE.—Joseph Henry Sigman, '95, Pa.

COMMENCEMENT DISTINCTIONS, 1912.

HONORS.—Harry Aaron Lipson, Newark, N. J.; Austin Hunsicker Reeves, Clinton, N. J.; William Gayley Simpson, Elizabeth, N. J.

ORATIONS.—Walter Amberson Barnes, Pittston; Howard Livingstone Benson, Washington, D. C.; Benjamin Ray Brown, Honesdale; Ralph Waldo Brown, Washington, D. C.; Milton Oliver Cederquist, Titusville; Herman Anson Dann, Titusville; William Franklin Dannehower, Jr., Norristown; David Davis, Summit Hill; Harold Fetter Grim, Ottsville; Floyd Johnson Hann, Phillipsburg, N. J.; Atcheson Laughlin Hench, Pittsburgh; Wilmer Jacob Hindenach, Riegelsville; Michael Joseph Kasprzak, Perth Amboy, N. J.; Harold John Lockwood, Newton, N. J.; Chester Arthur Murtaugh, Easton; William Luther Raup, Jr., Milton; Maurice Cleveland Wilson, Woodland.

PRIZES AWARDED.

SENIOR PRIZEMEN.

THE FRANCIS A. MARCH PHILOLOGICAL PRIZE: Herman A. Dann, Titusville.

THE ASTRONOMICAL PRIZE: William G. Simpson, Elizabeth, N. J.

THE BASSETT PRIZE IN CIVIL ENGINEERING: John B. Cline, Stewartsville, N. J., and Marino Diaz Quinones, Havana, Cuba.

THE B. F. BARGE PRIZE IN ORATORY: John D. Lindsay, Wilmington, Del.

THE SENIOR DEBATE PRIZES:

FIRST: George R. Wood, St. Clair.
SECOND: Donald W. Henry, Athens.
THIRD: Kemper G. McComb, Haddonfield, N. J.

THE CHEMICAL ESSAY PRIZE: William L. Raup, Milton.

THE GILBERT PRIZE IN OLD ENGLISH: J. Sheridan Linn, Paoli.

JUNIOR PRIZEMEN.

THE CLASS OF '85 PRIZE IN PHYSICS: Divided between Charles G. Eichlin, Easton, and John C. Kielman, Portsmouth, Ohio.

THE BLOOMBERGH PRIZE IN MODERN LANGUAGES: French prize, divided between Charles G. Eichlin, Easton, and Angelo M. Centanni, Philadelphia; German prize, Charles K. Reinké, Philadelphia.

THE SHAKESPEARE PRIZE: Angelo M. Centanni, Philadelphia.

THE JUNIOR ORATORICAL PRIZES:

FIRST: George A. Reiss, Elizabeth, N. J.
SECOND: Angelo M. Centanni, Philadelphia.
THIRD: Andrew M. Lowry, Dewart.

THE CHEMICAL ESSAY PRIZES: Irwin T. Darlington, West Chester, and Harry E. Tyson, Weatherly.

SOPHOMORE PRIZEMEN.

THE TRAILL GREEN MATHEMATICAL PRIZES:
FIRST: Theodore W. Chandler, Scranton.
SECOND: John Knight, Summit, N. J.

THE LOUNSBURY PRIZE IN CHAUCER: Lewis Robbin, Steelton, and William A. Herr, Hazleton.

THE EARLY ENGLISH TEXT SOCIETY'S PRIZE: Frederick H. Spotts, Williamsport.

THE CLASS OF '83 PRIZE IN ENGLISH: T. Wayne Trembath, Kingston.

THE B. F. BARGE MATHEMATICAL PRIZES:
FIRST: Carl C. Speidel, Washington, D. C.
SECOND: Earnest C. Watson, Columbus, Ohio.
THIRD: Frederick H. Spotts, Williamsport.

THE R. B. YOUNGMAN GREEK PRIZE: Frederick H. Spotts, Williamsport.

FRESHMAN PRIZEMEN.

THE LYMAN COLEMAN BIBLICAL PRIZES:
DIVISION A: William R. Amberson, Waynesboro.
DIVISION B: Merrill B. Davis, Boonton, N. J.
DIVISION C: Randall F. Holden, Washington, D. C.
DIVISION D: Leonard I. Houghton, Walpole, N. H.
DIVISION E: George R. Miller, Jr., Easton.
DIVISION F: Ralph F. Shaner, Pottstown.
DIVISION G: William H. Woodruff, Green Village, N. J.

THE PARK PRIZE IN LATIN: Divided between William R. Amberson, Waynesboro, and Merrill B. Davis, Boonton, N. J.

CLASS MONITORS.

Appointed for general excellence in study:
SENIOR CLASS: Jay I. Henshaw.
JUNIOR CLASS: Earnest C. Watson.
SOPHOMORE CLASS: William R. Amberson.
FRESHMAN CLASS: Lloyd M. Felmly and Willard A. Pollard, Jr.

THESES PRESENTED BY CANDIDATES FOR DEGREES IN THE TECHNICAL COURSES OF THE PARDEE SCIENTIFIC DEPARTMENTS.

1. Test of the Efficiency of a Brooks Centrifugal Pump.
    Benjamin Ray Brown, Honesdale.
    Austin Hunsicker Reeves, Clinton, N. J.
2. Tests of Water Meters.
    John Andrew Wilson, Jr., Landisburg.
    Leon Harold Woolsey, New Paltz, N. Y.
3. Tests of Paving Brick.
    Edward Heller Maier, Bridgeton, N. J.
    Chester Arthur Murtaugh, Easton.
4. Design of Sewerage System for College Hill.
    John Boyer Cline, Stewartsville, N. J.
    Marino Diaz Quinones, Havana, Cuba.
5. Determination of Efficiency of Dumpy Level.
    Elmer Lyon Jones, Scranton.
    William Vilas Hill, Bordentown, N. J.
6. Effect of Oil on Cement Mortar.
    Victor Raymond Schmidt, Nazareth.
7. Russell Fork Coals of Virginia.
    James Blair Easter, Pittsburgh.
8. Manufacture of Small Steel Castings from Electric Furnace.
    Charles Mathaei Addis, Newark, N. J.
9. Preparation of Ortho Nitro Phenol from Ortho Chlor Nitro Benzene.
    Kenneth Cushing Grinslade, Leonia, N. J.
10. Chemical Variation of Cambrian Dolomites in Delaware River.
    William Luther Raup, Jr., Milton.
11. Alcohol from Ethylene.
    Ernest William Roth, Wilkes-Barre.
12. The Action of Chemicals on the Lactic Acid Bacteria.
    Stanley Judson Thomas, Scranton.
    Milton Oliver Cederquist, Titusville.
13. The Cyanide Process for Extraction of Gold.
    Ross Herman Boas, Harrisburg.

14. The Concentration of Low Grade Copper Ore.
    WALTER AMBERSON BARNES, Pittston.
15. Calculation for the Application of the Split Air Current Method of Mine Ventilation.
    GEORGE EDWARD McELROY, Easton.
16. Balanced Hoists in Mines.
    RALPH WALDO BROWN, Washington, D. C.
17. The Installation and Testing of a Repulsion Induction Motor.
    HOWARD LIVINGSTONE BENSON, Washington, D. C.
    GEORGE R. KAERCHER DAY, Hazleton.
    ROBERT WALTON MUMMA, Steelton.
18. Complete Test of a Lincoln Adjustable Speed Motor.
    GEORGE BENJAMIN FILLMORE, Shickshinny.
    ROBERT CARTER HOWELL, Harmony, N. J.
    HAROLD JOHN LOCKWOOD, Newton, N. J.
19. Construction and Calibration of an Ulbricht Photometric Integrating Sphere.
    ALBERT JAMES GRAHAM, Easton.

THE ALUMNI ASSOCIATIONS.

The Alumni Association is composed of graduates of the College and such former students as left College before graduation, in good standing, as may be elected. The annual meeting is held on Tuesday, preceding Commencement Day.

The Association has the privilege of choosing, every alternate year, two members of the Board of Trustees, who hold office for six years. In June, 1912, Emery J. Kerrick, '91, of Germantown, Pa., and William A. May, '76, of Scranton, Pa., were chosen. In the Spring of 1914 two more will be voted for.

The Executive Committee is as follows: McCluney Radcliffe, M.D., '77, Chairman, Philadelphia; Robert F. Whitmer, '85, Philadelphia; Fred R. Drake, '86, Easton; James W. Fox, '88, Easton; J. F. Valieant, '99, New York, N. Y.; J. M. Porter, '86, Easton; Victor P. Wierman, '76, Trenton, N. J.; Thomas Fisher, '88, Philadelphia; James B. Baker, '84, New York City; George W. W. Porter, '85, Newark, N. J.

It is desirable to keep up the full record, so long maintained, of the residences, occupations, literary efforts, and public services of the alumni and former students of the College.

SOUTH COLLEGE.

Information is solicited in regard to these points, and also in reference to matters appropriate to the obituary record, which is annually prepared for the alumni association.

Each alumnus is asked to send his personal record, carefully revised to date, to the secretary before May 1, 1913.

LOCAL ASSOCIATIONS.

ALUMNI ASSOCIATION OF LAFAYETTE.

Charles D. Marvin, '78, New York, N. Y. . . . . *President*
A. C. Campbell, '84, Wilkes-Barre . . . . *Vice-President*
Rev. J. F. Stonecipher, D.D., '74, Easton . . . . . *Sec. and Treasurer*

THE LAFAYETTE ALUMNI ASSOCIATION OF NORTH-EASTERN PENNSYLVANIA.

William J. Trembath, '85, Wilkes-Barre . . . . *President*
Oscar J. Harvey, '71, Wilkes-Barre . . . . *Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF PHILADELPHIA AND VICINITY.

Chester E. Albright, '83, Philadelphia . . . . *President*
Charles B. Adamson, '77, 222 Walnut St., Phila . . . . *Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF NEW YORK AND VICINITY.

Charles D. Marvin, '78, New York, N. Y . . . . *President*
John F. Valieant, 165 Broadway, New York, N. Y . . . . *Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF THE WEST BRANCH.

Fred H. Payne, '88, Williamsport . . . . *President*
R. Fleming Allen, '90, Williamsport . . . . *Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF CENTRAL PENNSYLVANIA.

Rev. A. N. Hagerty, '81, Carlisle . . . . *Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF WESTERN PENNSYLVANIA.

George D. McIlvaine, '90, Pittsburgh . . . . *President*
A. Wilson McCandless, '06, Frick Bldg. Annex, Pittsburgh, *Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF MARYLAND.

Robert H. Smith, '67, 53 St. Paul Street, Baltimore, Md. . *President*
Pearce Kintzing, M.D., '81, Baltimore, Md . . . . *Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF CHICAGO AND VICINITY.

Nathan Grier Moore, '73, Chicago, Ill. . . . . *President*
Tracy D. Luccock, '05, 801 Manhattan Bl., Chicago, Ill... *Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF THE NORTHWEST.

Hon. James T. Hale, '77, Deerwood, Minn . . . . *Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF WASHINGTON, D. C.

Snowden Ashford. '88, Washington, D. C . . . . *President*
Eli Swavely, '96, 4101 Connecticut Ave., Washington, D. C . . . . *Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF NEW JERSEY.

Wayne Dumont, '92, Paterson, N. J . . . . *President*
Frederick F. Kennedy, '98, 774 Broad Street, Newark, N. J . . . . *Secretary*

ASSOCIATION OF ST. LOUIS AND THE SOUTHWEST.

Hon. Joseph P. Vastine, '56, St. Louis, Mo . . . . *President*
H. P. G. Coates, '92, St. Louis, Mo . . . . *Secretary*

STUDENTS.

GRADUATE STUDENTS.

S. B. Gilhuly, A.M., N. J.	History and English Literature,	Lafayette, '86.
J. B. Hench, A. M., Pa.	Latin,	Lafayette, '83.
Allan Roberts, Ph.B., M.S., Pa.	History and Political Science,	Lafayette, '99.
William H. Kirkpatrick, A.B., Pa.	History and Political Science,	Lafayette, '05.
Carmon Ross, Ph.B., Pa.	Modern Languages,	Lafayette, '05.
Cyrus H. Williston, B.S., N. J.	Chemistry and Biology,	Lafayette, '08.
Howard B. Bartolet, A.B., N. J.	Mathematics and Physics,	Lafayette, '08.
E. Graham Wilson, A.B., N.Y.	Psychology and Philosophy,	Lafayette, '07.
John Royden Hess, Ph.B., Pa.	Chemistry,	Lafayette, '07.
J. Sheridan Linn, A.B., Pa.	English, History, and Psychology,	Lafayette, '11.
John Elmer Stellwagon, Ph.B., Pa.	English, History, and French,	Lafayette, '11.
John Hawley Larned, A.B., Pa.	Modern Languages,	Clark Univ., '08.
John Cawley, B.S., Pa.	Mathematics and Astronomy,	Lafayette, '10.
David W. Phillips, A.B., Pa.	English and Pedagogy,	Lafayette, '05.

Harold John Lockwood, E.E., Pa. . . Physics,
Lafayette, '12.
Harold Dumont Beatty, A.B., Pa. . History and English,
Lafayette, '12.
Atcheson Laughlin Hench, A.B., Pa. History and English,
Lafayette, '12.
James Henry English, A.B., Pa. . . . . Modern Languages,
Dartmouth '12.

Graduates. 19

SENIOR CLASS, 1913.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM
Robert Alexander Altschuler	L.	Hackensack, N. J.	Φ Κ Ψ
James Burns Amberson, Jr.	L.	Waynesboro	71 B.
Charles Webster Andrews	E.E.	Buffalo, N. Y.	Θ Δ Χ.
Lorenz Kneedler Ayers	Ch.	Easton	No. 13th St.
Samuel Seymour Ball	E.M.	Elmira, N. Y.	Φ Κ Ψ
Gordon Harold Bannerman	C.E.	Titusville, N. J.	66 B.
Howard Livingstone Benson	C.E.	Washington, D. C.	——
Frederick Lucien Bird	C.	Altoona	61 B.
Howard Milton Bliem	E.E.	San Antonio, Texas	140 F.
William Miller Bond	C.	Saylorsburg	231 Cattell
Francis Shunk Brown, Jr.	L.	Philadelphia	Ζ Ψ
Adam Brown Caldwell	C.	Williamsport	35 S.
Angelo Maria Centanni	C.	Philadelphia	169 E.
Ralph Greenfield Chapman	L.	Newark, N. J.	Χ Φ
Richard Douglas Cheesman	Ch.	Easton	941 Lehigh
Isaac Carpenter Clark	E.M.	Takoma Park, D. C.	Φ Δ Θ
William Levin Coleman	C.	Easton	704 Walnut
Louis Creveling	Ch.	Bloomsbury, N. J.	38 S.
Edward Gilmore Cunningham	L.	Sewickley	75 K.
Irwin Taite Darlington	Ch.	West Chester	Δ Κ Ε
George Maximilian Dery	C.	Catasauqua	136 F.
Raymond Herbein DeTurck	L.	Oley	88 N.
Charles Garfield Eichlin	C.	Easton	1627 Northampton
Herbert Henry Eichlin	L.	Easton	36 So. 11th
Frank Eisberg	C.E.	Easton	1145 Ferry
Morris Sloan Evans	C.E.	Berwick	Φ Δ Θ
Edwin James Fager, Jr.	E.E.	Harrisburg	Φ Κ Ψ
Harry Clarence Fernau	C.E.	Jeddo	114 McK.
Jerome Edward Fishel	E.E.	Washington, D. C.	29 S.
Russell Holcombe Fisher	L.	Annandale, N. J.	Home
William Edward Fitzgerald	C.E.	Trenton, N. J.	76 K

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
James Aloysius Fleming	Ch.	Manchester, N. H.	107 McK.
Louis Fernald Foster	L.	Phillipsburg, N. J.	Home 40 Fairview Heights
Harry Thorton Francis	G.S.	Titusville	92 McK.
Thomas Armstrong Garretson	Ch.	Perth Amboy, N. J.	16 S.
Leslie Newton Gay	L.	Shamokin	Δ Κ Ε
Newell Hardy Grace	L.	Roslyn, L. I., N. Y.	117 McK.
William David Gross	Ch.	Kingston, N. Y.	75 K.
Robert Elliot Haas	L.	Allentown	Φ Δ Θ
Arthur Browne Hammond, Jr.	L.	West Chester	76 K.
William Oscar Hay, Jr.	E.E.	Easton	15th and Northampton
Jay Irvin Henshaw	L.	Honesdale	84 N.
George Heilman Heydt	E.E.	Lehighton	105 McK.
Herbert Moses Horne	C.	Vandergrift	Χ Φ
Henry Butts Huselton	G.S.	Port Murray, N. J.	232 McC.
Matthew Hale Jones, Jr.	C.	Easton	Hotel Huntington
George Van Sise Keely	C.E.	Bayonne, N. J.	15 S.
Lewis Hoke Kelly	L.	Latrobe	Φ Κ Ψ
David Francis Kennedy	L.	Youngstown, Ohio	Ζ Ψ
Milton Paine Kitchel	C.E.	Boonton, N. J.	105 McK.
Warren Woodward LaBarr	E.E.	Winwood	84 N.
Paul Fisher Landis	L.	Swarthmore	Δ Κ Ε
William Evan Lloyd, Jr.	E.E.	Bangor	138 F.
Andrew McClenathen Lowry	C.	Dewart	Brd.
John Fackenthal Magee	E.M.	Easton	Paxinosa Ave.
Frederick William Maue	E.E.	Hazleton	29 S..
Hugh McCauley Miller	L.	Philadelphia	Φ Κ Ψ
Frederick Moorby	C.E.	Jamestown, N. Y.	170 E.
Harry Waters Moore	L.	High Bridge, N. J.	36 S.
Harry Emil Nelson	L.	Altoona	68 B.
Gilbert Nickel	C.	Easton	17 So. 9th
Charles Leonard O'Brien	C.	Overton	107 McK.
James Lee Pardee	G.S.	Hazleton	Θ Δ Χ
Alfred Biddle Pearson	C.E.	Wyncote	Ζ Ψ

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Charles Knauss Reinke	L.	Philadelphia	821 Paxinosa Ave.
George Andrew Reiss	L.	Elizabeth, N. J.	34 S.
Lloyd Roberts	L.	Slatington	22 S.
Edgar Hoffer Royer	G.S.	Greensburg	Φ Δ Θ
Harry Thomas Shannon	L.	Bath, N. Y.	611 High
Alfred Weikel Shoemaker	Ch.	Allentown	Χ Φ
David Bishop Skillman	C.	Philadelphia	Θ Δ Χ
Leon Almon Smith	Ch.	Camptown	607 High
Alfred Leroy Spengler	Ch.	Easton	123 So. 7th
Lawrence Heck Stone	E.M.	Easton	478 Nesquehoning
Max Tischler	L.	Wilkes-Barre	63 B.
Clifford Sharp Trimmer	L.	Middle Valley, N. J.	40 S.
Harry Elmer Tyson	Ch.	Weatherly	51 S.
Cornelius John Ward	Ch.	Phillipsburg, N. J.	Home 21 Randall
George Raymond Waterbor	C.	Easton	548 Line
Roy Pursel Wilson	Ch.	Phillipsburg, N. J.	Home 68 Bullman
James Robert Winner	L.	Wilmington, Del.	36 S.
Russell Henry Wolbach	E.E.	Easton	37 So. 13th
David Ober Wolf	L.	Highspire	Δ Υ
Harry Smedley Wolf	Ch.	Reading	148 P.
Burton Guy Wood	Ch.	Johnstown, N. Y.	611 High
Thomas Allen Wright, Jr.	C.	Wilkes-Barre	Δ Κ Ε
William Norris Wysham	C.	Baltimore, Md.	35 S.
John Ephraim Young	Ch.	Easton	325 McC.

SENIORS 88

JUNIOR CLASS, 1914.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Claude Mark Albert	M.E.	Pen Argyl	33 S.
Walter DeWitt Barker	L.	Matawan, N. J.	10 S.
William Raymond Bender	C.	East Bangor	1809 Ferry
Pierson Booth	C.E.	Middletown, N. Y.	66 B.
Ralph Fitch Brown	C.E.	Honesdale	145 P.
Harold Robertson Bruen	G.S.	Rockaway, N. J.	——
Edmund Hance Carhart, Jr.	L.	Belvidere, N. J.	Ζ Ψ
Theodore Williams Chandler	Ch.	Scranton	33 S.
Edward Granville Chesley	L.	Haverhill, Mass.	Χ Φ
Charles Chipman	G.S.	New York, N. Y.	——
John Wellington Cleaver	L.	Danville	146 P.
Earl Vincent Cline	C.	Williamsport	151 P.
Stanley Howard Cline	E.M.	Phillipsburg, N. J.,	Home, R. F. D. No. 2
John Riegel Clymer	E.E.	Riegelsville	Θ Δ Χ
Kenneth Hendrick Colville	C.E.	Carbondale	15 S.
Charles Walter Conde	C.E.	High Bridge, N. J.	41 S.
James Ray Conrad	C.E.	Reading	33 S.
Joseph Watson Craft, Jr.	G.S.	Ambler	140 F.
Spencer Danby	C.E.	Easton	Wayne Ave.
Gilbert Lane Dannehower	M.E.	Norristown	Φ Κ Ψ
Allan Palmer Darlington	M.E.	West Chester	Δ Κ Ε
Vergil Alvin Davison	E.E.	Easton	Prof. Davison's
Samuel James DeWees	C.	Reading	130 McC.
Gershom Porter Ellis	E.E.	Avoca	Brd.
Paul Williams Emanuel†	Ch.	Catasauqua	Θ Δ Χ
Charles Clark Evans	G.S.	Berwick	———
Solon John Fegely	C.	Mertztown	88 N.
William Ward Frick	M.E.	Pittsburgh	Φ Κ Ψ
Frederick Conrad Gamsu	C.E.	Arverne, L. I., N. Y.,	50 No. 9th
Earl DuTot Gardner	C.	Easton	808 Northampton
William Gould Gould	E.M.	Easton	746 Washington

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
John Summerfield Green, Jr.	G.S.	Gittings, Md	70 B.
Milton Conrad Ham	L.	Millbrook, N. Y.	127 M.
Harold Pauli Heil	C.E.	Easton	106 Cattell
William Albert Herr	L.	Hazleton	39 S.
Horace Kratz Hiestand	L.	Palm	161 E.
William Rodney Holbert	L.	Warrington	70 B.
James Walter Hollenbach	Ch.	Reading	127 M.
Robert Volk Keihner	L.	Collingswood, N. J.	42 S.
Gordon Arnold Kelly†	Ch.	Easton	128 No. 2d
Raymond AnthonyKetchledge	C.	Easton	1113 Washington
John Carl Kielman	M.E.	Portsmouth, Ohio,	Prof. Hardy's
Thomas Lester Killough	L.	Elizabeth, N. J.	50 S.
John Knight	C.E.	Summit, N. J.	45 S.
Frederick Louis Kolb	E.E.	Scranton	89 N.
Clarence Albert Kresky	L.	Scranton	113 McK.
Harold Samuel Laird	C.	West Chester	Prof. Youngman's
Russell Keller Laros	E.E.	Easton	410 Porter
Douglas Perkins Lawall	L.	Easton	69 No. 2d
Benjamin Lewis	C.E.	New York, N. Y.	67 B.
John Roland Lounsberry	G.S.	Branchport, N. Y.,	614 Coleman
LeRoy Gilbert Lugar	L.	Ashbourne	131 M.
Robert Chesebrough McCorkle	G.S.	New York, N. Y.	Φ Κ Ψ
Thomas Francis McDonald, Jr.	L.	Stroudsburg	44 S.
David Burrell McWilliams	C.E.	Mifflinburg	115 McK.
John Wesley Magee	E.E.	Easton	Meixsell and Pierce
John William Mann	L.	Stockertown	45 S.
James Anderson Mason	C.	Toms River, N. J.	24 S.
Edward Dodd Mead	Ch.	Newark, N. J.	Δ Κ Ε
Francis Kinsey Metzger	C.E.	Phillipsburg, N. J.	Home 71 Bennett
Fred Nathan Miller	C.	Easton	414 McC.
Russell Cline Miller	C.	Phillipsburg, N. J.	Home R. F. D. No. 2
Hobart Condit Mitchell	E.E.	Boonton, N. J.	100 McK.
William McKee Moffat	C.	Fort Wayne, Ind	136 F.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
William Augustave Moore	L.	Trenton, N. J	*Φ* Δ *Θ*
Charles Conyngham Morgan	L.	Wilkes-Barre	114 McK.
Floyd Jackson Palmer	C.	Pen Argyl	113 McK.
David Paul	L.	Maghera, County Derry, Ireland,	37S.
Chester Gordon Peck	Ch.	Perth Amboy, N. J	49 S.
John Pfromm	Ch.	Hazleton	51 S.
Roger Prosser	L.	Minersville	90 N.
William Clarence Pryce	C.	Ebensburg	149 P.
Robert Leon Rankin	L.	Berlin, N. J	109 McK.
Frank Joseph Reiser	L.	Hollidaysburg	148 P.
James Thompson Reside	C.E.	Salem, N. J	99 McK.
Lewis Robbin	L.	Steelton	147 P.
Joseph Seitz Rodenbough	L.	Easton	410 Clinton
Johnston Wilbur Roling	L.	Easton	900 Butler
James Hiatt Salmon	C.E.	Scranton	108 McK.
Charles Abram Secor	C.E.	Arlington, N. J	34 S.
Abraham Jacob Segal	L.	Scranton	6 S.
John Morris Shimer	E.E.	Easton	812 Ferry
Burton Sturdevant Shupp	L.	Wilkes-Barre	28 S.
Moses Hiles Simmons	E.E.	Hamburg, N. J	72 B.
Vincent Robinson Smith	L.	Scottdale	*Θ* Δ *Χ*
Ward Mahlon Snyder	L.	Easton	244 Bushkill
John Lang Speer	G.S.	Vandergrift	*Χ Φ*
Carl Caskey Speidel	L.	Washington, D. C	109 McK.
Frederick Hiram Spotts	C.	Williamsport	151 P.
Frederick Josiah Spry	C.E.	Kingston	174 E.
Thomas Findley Steele	C.E.	Shamokin	607 High
William Grant Taggart	C.E.	Fracksville	78 K.
Walter Walton Thompson	E.E.	Baltimore, Md	5 S.
Roger Lockwood Totten	L.	Jersey City, N. J	147 P.
Thomas Wayne Trembath	L.	Kingston	28 S.
William Wagenhurst	M.E.	Norristown	Δ *Κ Ε*
Earnest Charles Watson	L.	Columbus, Ohio	130 M.
Francis Walton Wolff	C.E.	Newark, N. J	37 S.
Gilbert Allan Woods	L.	Easton	Chestnut and Cattell
Andrew Young	L.	Irvington, N. J	100 McK.

JUNIORS 100

SOPHOMORE CLASS, 1915.

Name.	Course of Study.	Residence.	Room.
Stuart Welsh Adler	L.	Passaic, N. J.	133 M.
Alcides Miguel Alcazar	E.E.	Corocoro, Bolivia, South America	231 Cattell
William Ruthrauff Amberson	L.	Waynesboro	100 Cattell
Edgar Maurer Anderson, Jr.	C.E.	Jersey City, N. J.	Δ Υ
Harold William Anderson	Ch.	Paterson, N. J.	133 M.
William Ross Andre	L.	Stroudsburg	43 S.
Harold Wilbur Bailey	E.E.	Milburn, N. J.	85 N.
George Leonidas Evrotas Bellas	C.E.	Sparta, Greece	——
John Winfield Bennett	L.	Patchogue, N. Y.	135 F.
Cornelius Bergen	L.	Dubuque, Iowa	Δ K E
Andrew Gustave Bisset	C.E.	Washington, D. C.	11 S.
Harry Nelson Bockus	Ch.	Gouverneur, N. Y.	Δ K E
Willard Harry Bond, Jr	G.S.	Brooklyn, N. Y.	Δ K E
Charles Sherwood Boyce	C.E.	Binghamton, N. Y.	Φ K Ψ
Edwin Douglas Boyce	C.E.	Binghamton, N. Y.	Φ K Ψ
Edward Daniel Brannon	C.	Hazleton	50 S.
Alexander Paul Brown	E.M.	Philadelphia	——
George Garwood Brown	G.S.	Lakewood, N. J.	134 M.
Wilbur Aaron Bryan	L.	Hackettstown, N. J.	232 McC.
Richard Griffith Burn	L.	Oxford	150 P.
Henry Lovell Carr	G.S.	New York, N. Y.	——
Paul Leo Clugston	L.	Waynesboro	106 McK.
David Rhea Coffman	C.	Scotland	131 McC.
George Aloysius Collins	L.	Wilkes-Barre	181 St. Joseph
William Hazel Collins	E.M.	Washington, D. C.	Χ Φ
Howard Strong Conklin, Jr.	E.E.	Patchogue, N. Y.	Δ Υ
Harry Abner Cook	E.E.	Easton	200 McC.
Donald Otto Coughlin	L.	Luzerne	73 K.
William Lewis Cunningham	Ch.	Pittsburgh	106 McK.

Name.	Course of Study.	Residence.	Room.
Lester Marshall Curtiss	Ch.	Norfolk, Conn	Σ Χ
Charles Junkin Davenport	E.E.	Wilkes-Barre	74 K.
Frederick King Davidson	Ch.	Boonton, N. J	129 M.
Merrill Boswell Davis	L.	Boonton, N. J	81 N.
Dwight Moody Decker	Ch.	West Pittston	Δ Υ
Joseph Francis Deegan	L.	Perth Amboy, N. J.	122 McK.
Joseph Ignatius Diamond	G.S.	Cynwyd	Δ Υ
William Lukens Edwards	C.E.	Lansdale	163 E.
John James Egan, Jr.	L.	Trenton, N. J	79 N.
Robert Edmonston Ellis	M.E.	Paterson, N. J	115 McK.
William Johnson English, Jr.	E.E.	Ocean Grove, N. J	45 S.
Frank Arthur Ernst	C.E.	Hoboken, N. J	Δ Υ
Robert Jacobs Eshleman	Ch.	Berwick	Χ Φ
Stanley Richards Evans	C.	Moosic	601 High
Henry Rudolph Finger	L.	Wilkes-Barre	Σ Χ
George Swift Freeman	G.S.	Easton	501 Lafayette
Edgar Miller Furry	G.S.	Altoona	Χ Φ
John Henry Gaffin	C.E.	Wyoming, N. Y	703 High
Wilson Baughman Gaither	L.	Greensburg	Δ Κ Ε
James Russell Gardner	C.E.	Scranton	701 High
William McKee German	C.	Pittsburgh	Φ Κ Ψ
Dudley Able Giberson	L.	Easton	246 Bushkill
Benjamin Goldberg	L.	Trenton, N. J	135 F.
Gerald Garner Grant	M.E.	New York, N. Y	Δ Υ
Karl Franklin Gray	E.E.	Easton	113 Northampton
Vaughan Hatfield Griffith	L.	Rutherford, N. J	Φ Κ Ψ
Martin Thomas Hagerty, Jr.	G.S.	Phillipsburg, N. J.,	Home, Fairview Heights
Edgar Thomas Hammer	L.	Greensburg	Φ Δ Θ
Howard Hanks	C.E.	Ridgewood, N. J	Χ Φ
William Joseph Happel†	L.	Tatamy	Home
Harvey Taylor Harrison	G.S.	Pittsburgh	Χ Φ
George Ezra Hawkins	E.E.	Centre Moriches, N. Y	62 B.
Emory Wilbur Helfrich	G.S.	Pleasantville, N. J	Χ Φ
James Monroe Hess, Jr	L.	East Mauch Chunk	79 N.
Ralph Blake Hindman	C.	Chillicothe, Ohio	———
Randall Francis Holden	C.E.	Washington, D. C	87 N.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Joel Grant Holmes	E.E.	Forked River, N. J	Z Ψ
Charles Wood Horr	L.	Newark, N. J	Θ Δ X
Alfred Lobb Jeffery	C.	Pen Argyl	116 McK.
Harold West Johnson	C.E.	Sparrowbush, N. Y	81 N.
Howard Riegel Johnson†	L.	Riegelsville	Home
George Edward Johnston	G.S.	Akron, Ohio	Φ Δ Θ
William Harrison Johnston	C.	Philadelphia	175 E.
Alexander Weikel Jordan	E.M.	Easton	1055 Butler
William George Keat	M.E.	Pen Argyl	122 McK.
James Henry Kennedy	E.E.	Lansdowne	61 B.
John R. Kenyon	C.E.	Binghamton, N. Y	Φ K Ψ
Joseph Homet Kerrick	E.M.	Germantown	97 McK.
Walton Barr Killough	E.E.	Elizabeth, N. J	48 S.
Harold Custer Kressler	M.E.	Bangor	130 M.
George Washington Krick	C.E.	Richmond Hill, N. Y	X Φ
Nelson David Langenbach	Ch.	Easton	R. D. No. 2
Gordon Lee	L.	Carbondale	86 N.
Paul Morley Lee	E.E.	Middletown, N. Y	78 K.
Harry Mulford Leek	L.	Amagansett, N. Y	138 F.
LeRoy Lefferson	E.E.	Manasquan, N. J	85 N.
Horace Algert Lehr	C.	Easton	1144 Butler
John Seivel Leister	C.E.	Reedsville	11 S.
Grover Cleveland Lesser	E.M.	Upper Lehigh	314 McC.
Russell Fairchild Lloyd	L.	Bangor	———
Arthur Jefferson Lockard	Ch.	Easton	102 Cattell
Charles Raymond Lohman	E.E.	Kingston	80 N.
Cornelius John McCarthy	C.E.	Shamokin	———
William Henry McCutcheon, Jr.	L.	Wayne	Φ Δ Θ
Robert Dallas McManigal	E.E.	Logan, Ohio	80 N.
Warren Bryan Mack	L.	Flicksville	637 High
Walter Seeley Mallory, Jr.	Ch.	Easton	Θ Δ X
Edward John Fox Marx	L.	Easton	8 Chestnut Terrace
John Alpheus Matthews	Ch.	Altoona	77 K.
*Albert Willis Maue	E.E.	Hazleton	
John Maxwell	C.	Easton	612 Cattell

*Died December 15, 1912.

Name.	Course of Study.	Residence.	Room.
Otto May	L.	Pittsburgh	68 B.
Arthur Leon Meyer	Ch.	Trenton, N. J	Φ Δ Θ
Carl Nicholas Miller, Jr	Ch.	Bangor	118 McK.
George Roland Miller, Jr	C.	Easton	323 High
John Heiks Paul	E.E.	New Kingston	121 McK.
Leonard Carlton Peckitt†	Ch.	Catasauqua	Θ Δ Χ
George William Porter	L.	Greensburg	609 High
William Hunter Powell	E.E.	Wyncote	Ζ Ψ
Lewis Matten Prutzman	L.	Hamburg	16 S.
Shipman Roseberry Pursel	C.E.	Phillipsburg, N. J.,	Home, R. F. D.
William Rockefeller Rasquin	C.E.	Flushing, N. Y	Δ Κ Ε
Barron Peard Rex	L.	Rumson, N. J	131 M.
Jules Darius Roberts, Jr	M.E.	Dallas, Texas	117 McK.
Roy Thomas Robling	C.	Moosic	37 S.
Harold Montgomery Romig	C.E.	Easton	225 No. 10th
Carl Fawcett Scharpf	L.	Coraopolis	Δ Υ
Ralph Andrew Schilling	E.M.	Easton	208 No. 7th
Arthur Anders Schultz	Ch.	Norristown	134 M.
Walter James Scott	L.	Collingswood, N. J	116 McK.
Frank Jacob Seibert	Ch.	Easton	640 Wolf
Ralph Faust Shaner	L.	Pottstown	162 E.
Paul Colver Shoemaker	Ch.	Allentown	Φ Δ Θ
William Cecil Short†	Ch.	Easton	1312 Washington
Harold William Sloyer	Ch.	Easton	R. D. No. 6
Ernest Elwin Smith	E.E.	Lehighton	165 E.
Sylvester Comstock Smith, Jr.	C.E.	Phillipsburg, N. J.,	Home, 97 So. Main
Foster Byron Snowden	L.	Conemaugh	139 F.
Robert Smith Soles	E.E.	McKeesport	Φ Κ Ψ
Paul Virchow Speer	G.S.	Vandergrift	Χ Φ
Stanley Caswell Spiegel	G.S.	Detroit, Mich	Χ Φ
William Joel Spry	L.	Plymouth	174 E.
Millard Fillmore Staples	C.	Stroudsburg	Χ Φ
Benjamin Cornell Stevens	L.	Wyalusing	230 McC.
Frank Marshall Sweeny	C.E.	Baltimore, Md	89 N.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
William Perry Tallman	L.	Phillipsburg, N. J.	Home, 35 Bullman
Lewis Grant Teetsell	Ch.	Tarrytown, N. Y.	Δ Υ
James Donohoe Toole	L.	Minersville	90 N.
Lyman Charac VanInwegen	E.E.	Hugenot, N. Y.	129 M.
Donald Weidman Vaughters	L.	Chillicothe, Ohio	137 F.
George Willever Walton	L.	Berwick	9 Sitgreaves, Phillipsburg, N. J.
James Jamison Waygood	L.	Oak Lane	Φ Δ Θ
Benjamin Harrison Welty†	L.	Waynesboro	Φ Δ Θ
Lea Danehower Williams	G.S.	Washington, D. C.	Χ Φ
Russell Stanley Woglom	L.	Perth Amboy, N. J.	49 S.
William Harrison Woodruff	L.	Green Village, N. J.	1440 Washington
Harold John Woodward	L.	Cookstown, N. J.	97 McK.
Lewis Benjamin Wyckoff	C.E.	Asbury Park, N. J.	43 S.

SOPHOMORES.. 147

FRESHMAN CLASS, 1916.

Name.	Course of Study.	Residence.	Room.
Clarence Samuel Ackerman	L.	Flicksville	637 High
John Quincy Adams	C.E.	Easton	———
George Lenher Alexander	Ch.	Everett	601 High
Arthur Hammond Amick, Jr.	M.E.	Cumberland, Md.	27 S.
Karl Janeway Ammerman	M.E.	Scranton	Δ Γ
Ross Quay Augustine	L.	Uniontown	Θ Δ Χ
John Watts Baer Bausman, Jr.	G.S.	Lancaster	Δ Κ Ε
Joseph Shakespeare Beddall	Ch.	Tamaqua	Σ Χ
Clair William Behney	L.	Lebanon	———
Harry Weinstein Belfor	E.E.	West Belmar, N. J.	———
Albert Beyer, Jr.	C.E.	Atlantic City, N. J.	Δ Κ Ε
Harvey MacKnight Black	C.	Easton	129 Pierce
Daniel McMichael Blackburn	E.E.	Easton	807 Wood
Paul Morse Blackburn	Ch.	Greensburg	152 P.
Roger Hunt Blake	C.	Trenton, N. J.	94 McK.
Harry Lavern Braden	Ch.	Franklin	136 McC.
Wendell Spencer Carpenter Brearley	C.	Bradley Beach, N. J.	94 McK.
Earl Andrew Brinker	Ch.	Easton	415 High
James McKinley Brittain	L.	Muncy	102 McK.
Clarence Jenkins Brown	L.	Lakewood, N. J.	144 P.
Hugh Jackson Bubb	G.S.	Williamsport	Δ Κ Ε
Richard Cameron Cain	Ch.	Berwick	136 McC.
Thomas Derby Carey	L.	Moosic	232 McC.
Howard Baily Cheyney	L.	Williamsport	Δ Κ Ε
John Kay Christmas	E.E.	Easton	Sullivan
Charles Samuel Clark	C.E.	Binghamton, N. Y.	709 High
Robert Nesbitt Clark	L.	Wilkes-Barre	83 N.
C. Walter Coapman	G.S.	Rochester, N. Y.	———
George Tylden Cobb	L.	Wilkes-Barre	74 K.
Marshall Cochran	Ch.	West Chester	145 P.
George Nathaniel Cohen	C.E.	Washington, D. C.	711 High

Name.	Course of Study.	Residence.	Room.
Floyd Hoff Compton	C.E.	Springtown, N. J	Home
Harry Spenser Cooper	C.E.	Belmar, N. J	130 McC.
William Mead Cornwell	E.E.	Blairstown, N. J	Φ Δ Θ
Norman Cortright	C.E.	Belvidere, N. J	———
Cecil Harold Couch	C.E.	Hampton, N. J	41 S.
Carl McMaster Crawford	C.	Indiana	705 High
Charles Markley Crawford, Jr.	G.S.	Ironton, Ohio	Χ Φ
Emerson DelRoy Creveling	G.S.	Brooklyn, N. Y	Δ Υ
Earle Rice Davis	Ch.	Haddon Heights, N. J	———
Jasper Newton Deeter, Jr.	L.	Harrisburg	131 McC.
William Eugene Delaney, Jr.	L.	Williamsport	98 McK.
Morton de Waltoff	Ch.	Brooklyn, N. Y	———
John Patrick Diamond	M.E.	Cynwyd	Δ Υ
Edwin Augustus Dickinson	L.	Ligonier	———
Earnest Joseph Dillman	E.M.	Cheyenne, Wyo	———
Theodore Mulford Doan	G.S.	Berwick	136 McC.
Colin Tolmie Dodd	G.S.	Phillipsburg, N. J.	Home, 32 Chambers
Warren Gore Donaldson, Jr.	Ch.	Trenton, N. J	Φ Δ Θ
John Earle Donmoyer	G.S.	Lebanon	Δ Υ
Sydney Fetherman Downs	E.E.	Easton	128 Parsons
Frederick Drexel	C.E.	Brooklyn, N. Y.	231 Cattell
Alfred Hall Drummond	E.E.	Nanking, China	167 E.
John Hannaniah Dyer	L.	Scranton	108 McK.
Joseph Raymond Evans	L.	Chester, N. J	———
Harrison Robert Fehr, Jr	E.E.	Easton	830 Lehigh
Lloyd McPherson Felmly	L.	Phillipsburg, N. J.	Home, 5 Front
Harold Davies Fernau	L.	Jeddo	314 McC.
James Leslie Fisher	L.	Rummerfield	230 McC.
Joseph Fitts	E.E.	Washington, N. J	———
Samuel Brown Fleming	Ch.	Easton	830 McC.
Willis Austin Flory	M.E.	Bangor	118 McK.
Edward Emmons Ford	G.S.	Binghamton, N. Y.	709 High
Ralph Sprague Ford	L.	Richmond, Ohio	132 Cattell
Clarence Welch Forshee	G.S.	Glenwood, N. J	72 B.
Philip Frederick Forve	G.S.	Los Angeles, Cal.	Ζ Ψ

Name.	Course of Study.	Residence.	Room.
Harry LaTourette Foster	L.	Brooklyn, N. Y.	69 B.
Louis Rodman Fox	E.E.	Easton	336 Reeder
Sylvio de Campos Freire	C.E.	Sao Paulo, Brazil,	325 Spring Garden
Karl Robert Freytag	L.	Easton	——
Russell Harrison Fritz	M.E.	Glen Gardner, N. J.	Home
Adolph Stephen Gabor	L.	Hazleton	130 McC.
Gardner Gantz	G.S.	Rapid City, S. D.	Δ Υ
William Harold Garis	C.E.	Phillipsburg, N. J.,	Home, 10 Raymond
William Joseph Gaynor	L.	Phillipsburg, N. J.,	Home, 76 Fayette
William Reading Gebhardt	L.	Clinton, N. J.	38 S.
Frederick Augustus Glisencamp	L.	Mount Tabor, N. J.	164 E.
Harman Reasoner Goldthwaite	G.S.	Marion, Ind.	Ζ Ψ
Forrest LeBarre Graves	E.E.	Delaware Water Gap	——
Walter Berton Grigsby	C.E.	Washington, D. C.	Χ Φ
John Edward Guiney	L.	Wilkes-Barre	73 K.
Joachim Isaac Gulick	L.	White House Station, N. J.	132 Cattell
Frank Sharp Hammond	M.E.	Coatesville	77 K.
T. Walter Hannum	Ch.	West Chester	24 S.
Jay Wilson Harrison	Ch.	Easton	210 Bushkill
Ralph Lemuel Hart	C.E.	Ravenna, Ohio	2 S.
Mathias Saxman Hartman	G.S.	Latrobe	139 F.
Harry Cyphers Hartung	E.E.	Phillipsburg, N. J.,	Home, 47 Washington
Francis Ogden Hathaway	L.	Deposit, N. Y.	93 McK.
Harry Roosevelt Heins	L.	Cranford, N. J.	103 McK.
Lester Baker Hennessey	L.	Lynn, Mass.	Φ Δ Θ
George Matthews Henry	G.S.	Lebanon	Δ Υ
Ray DeWitt Herring	C.	Pen Argyl	168 E.
Christian Aaron Hess	Ch.	Stroudsburg	44 S.
Alexander Christy Hobson	L.	Philadelphia	149 P.
Bernard Sol. Hoffenstein	L.	Wilkes-Barre	711 High
Harold Leon Hubbell	C.E.	Ravenna, Ohio	2 S.

Name.	Course of Study.	Residence.	Room.
Leslie Royce Huff	E.E.	Bloomsbury, N. J.	Home
Paul Hacke Hugus	L.	Latrobe	Φ K Ψ
Frederick Blackburn Hunt	E.E.	Trenton, N. J.	65 B.
Frank Leo Hurst	C.E.	Bradley Beach, N. J.	——
John Rexroth Irwin	L.	McConnellsburg	601 High
Homer Miller Jacobs	L.	Pottstown	154 E.
Sedgwick Kistler Johnson	Ch.	Easton	357 Bushkill
Robert Thompson Johnstone	G.S.	Titusville	——
Harry Melick Keller	Ch.	Stroudsburg	83 N.
Charles Langdon Kennedy	L.	New York, N. Y.	235 McC.
Edward Porter Kennedy	L.	Wyalusing	158 E.
George Wilbur Kidney	M.E.	Phillipsburg, N. J.	——
Allan Price Kirby	G.S.	Wilkes-Barre	Z Ψ
Elmer Walton Kirk, Jr.	C.E.	Doylestown	62 B.
William Irwin Kocher	L.	Easton	R. D. No. 2
Russell Stewart Kramer	E.E.	Easton	724 Coleman
Kenneth Wolfinger Kressler	L.	Easton	13th and Butler
Robert Louis Kreutzberg	C.E.	Massillon, Ohio	82 N.
Karl Ferdinand Kuebler	Ch.	Easton	——
John Raymond Kuechel	C.E.	Elizabeth, N. J.	150 P.
Paul Angier Laird	Ch.	West Chester	Prof. Youngman's
Marvin Carter Morrison Lane	E.E.	Roselle Park, N. J.	——
Robert Warne Laubach	L.	Northampton	Δ Υ
John Curry Lee	M.E.	Pottsville	Θ Δ Χ
Harry William LeGore	L.	LeGore, Md.	Φ K Ψ
Stanley Matthew Leicht	G.S.	Cleveland, Ohio	137 F.
Frederic Tabor Leighton	C.E.	Mount Tabor, N. J.	——
Adie Lloyd Leonard	L.	Hollidaysburg	157 E.
Claude Brinser Lerch	L.	Highspire	Δ Υ
Bennett Moorhead Livezey	Ch.	Doylestown	110 McK.
Jacob Livingston	G.S.	Dover, N. J.	166 E.
Solomon Livingston	G.S.	Dover, N. J.	166 E.
Richard Bennett Lloyd	C.E.	Washington, D.C.	92 McK.
Richard Whitney Logan	M.E.	Scranton	128 M.
Robert Lee Logan	L.	Philadelphia	173 E.
Charles Ansel Loller	Ch.	Dennison, Ohio	Χ Φ

Name.	Course of Study.	Residence.	Room.
Lee Hinman Lucas	G.S.	New York, N. Y.	Z Ψ
Alexander Crow Lyle	L.	Erma, N. J.	———
Lawrence Thomas McCormick	C.E.	Belmar, N. J.	130 McC.
Russell Thomas McFall	C.E.	Flicksville	637 High
Edward Allen McGuire, Jr.	E.E.	New York, N. Y.	———
Thomas Parker McKee, Jr.	C.	Parke	Σ Χ
Francis Andrew March	C.E.	Harrisburg	130 McC
William Leo Matthes	E.E.	Phillipsburg, N. J., Home,	99 Sitgreaves
Guy Edmund Mauser	Ch.	Catasauqua	27 S.
Kenneth Alston Maxwell	L.	Meadowbrook, N.Y.	101 McK.
Joseph Mayer	L.	Easton	41 So. 10th
Harold Cottrell Middleton	M.E.	East Orange, N. J.	12 S.
Norman William Miller	Ch.	Washington, D. C.	128 Porter
William James Sill Miller	G.S.	Harrisburg	Φ Δ Θ
Benjamin Birch Milnes	L.	Deposit, N. Y.	95 McK.
Charles Byron Morgan†	G.S.	Wilkes-Barre	Z Ψ
Gerald Amos Morgan	C.E.	Harrisburg	Φ Δ Θ
Leon Newpher Morgan	C.E.	Harrisburg	Φ Δ Θ
Siores Rosario Morra	C.E.	Montreal, Canada	———
Everett Sedgwick Moyer	L.	Williamsport	157 E.
Harold Mumma	E.E.	Steelton	99 McK.
Frank Maurice Murphy	L.	Greensburg	159 E.
Milton Kendall Myers	Ch.	Washington, D. C.	87 N.
Harry Campbell Neely	C.	Woodbine	232 McC.
James Hance Neighbour, Jr.	C.E.	Dover, N. J.	152 P.
Louis Odenwelder	G.S.	Easton	———
Harold Herman Offutt	Ch.	Washington, D. C.	703 High
Willard Thomas O'Hara	L.	Phillipsburg,, N J., Home,	595 So. Main
Paul Wenrick Oliver	C.	York	143 P.
John Secrist Oller	L.	Waynesboro	101 McK.
Hanly Woodin Oswald	G.S.	Cumberland, Md.	Δ Κ Ε
George Wiggan Parmly	E.M.	Shamokin	Δ Κ Ε
Norman Kethlege Pearson	C.E.	Flicksville	Home
James Preston Penfield	M.E.	New York, N. Y.	———
Daniel James Perry	E.E.	Easton	137 So. 13th

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Elbert B. Pickell	Ch.	Whitehouse, N. J.	132 Cattell
Edward Arthur Pitcher	C.E.	Dover, N. J.	128 M.
Willard Averell Pollard, Jr.	C.E.	Washington, D. C.	136 McC.
Ernest Race	Ch.	Oxford, N. J.	91 McK.
Albert Louis Rakatzky	C.E.	Bridgeport, Ct	———
Freeman Leigh Rawson	E.E.	New York, N. Y.	*Ζ Ψ*
Thomas Bancroft Reifsnyder	L.	East Orange, N. J.	47 S.
William Franklin Remaly	C.E.	Easton	409 High
Chauncey Hoffman Ribble	E.E.	Washington, N. J.	23 S.
George James Richards	E.E.	Wilkes-Barre	176 E.
William Wallace Robertson	C.E.	Washington, D. C.	132 Cattell
Cecil Blair Rogers	L.	Sugar Run	153 E.
Ross Wadsworth Rohn	L.	Sussex, N. J.	171 E.
Herbert Knapp Rollins	E.M.	New York, N. Y.	314 McC.
Daniel Leroy Ross	C.E.	Easton	137 So. 12th
Jacob Bergen Rue, Jr.	G.S.	Red Bank, N. J.	119 McK.
David Mohler Rupp	C.	Shiremanstown	121 McK.
James Scarlet, Jr.	L.	Danville	146 P.
Fritz Scheeren	L.	Ford City	*Χ Φ*
Frank Huff Schlough	E.E.	Easton	109 Orchard
Wendell Dermger Schoch	G.S.	St. Davids	12 S.
William Neely Scott	M.E.	Easton	824 Grant
William Herbert Seiple	L.	Easton	74 No. 4th
John Bradley Sheffield	Ch.	Pompton Lakes, N. J.	3 S.
Charles Lionel Shiber	C.E.	Wilkes-Barre	———
Earl Russell Smith	E.E.	Easton	1091 Berwick
Henry Jacob Smith	L.	New Oxford	6 S.
Lewis Aaron Smith	C.	Easton	R. D. No. 2
William Blair Smith	L.	Belvidere, N. J.	———
Walter Thomas Spry	Ch.	Plymouth	172 E.
Harold Van Allen Stewart	E.E.	Quakake	130 McC.
Samuel Biffert Stilwell	L.	Doylestown	110 McK.
John Norwood Stipe	L.	Easton	13th and Bushkill
Leon Stansfield Stone	L.	Newton, N. J.	230 McC.
Russell Bennett Stone	L.	Easton	476 Nesquehoning
Herbert Russ Storr†	G.S.	Easton	501 Reeder
Guy Holden Stoutenburgh	G.S.	Far Hills, N. J.	*Φ Κ Ψ*

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Paul Strasburg†	G.S.	Detroit, Mich	98 McK.
Nathan Walter Suplee	C.E.	Malvern	———
Charles Xavier Thomas	G.S.	Freeland	144 P.
Henry Huston Thomas	L.	Franklin	5 S.
John William Thompson	G.S.	Washington, D. C.	θ Δ Χ
Oscar Saul Tischler	L.	Wilkes-Barre	711 High
Henry Moffett Tonkin	E.M.	Millington, Md	131 McC.
James Lilly Trowbridge	C.	Easton	301 Cattell
George Brinton McClellan Troxell	Ch.	Easton	Charles and Madison
Richard Britton Unangst	Ch.	Wilkes-Barre	609 High
Carl Snyder VanName	C.E.	Flushing, N. Y.	———
Charles Reinhart Wackenhuth	L.	Picture Rocks	102 McK.
Francis Eugene Walter	G.S.	Easton	———
Frank Frederick Weaver	Ch.	Easton	18th and Butler
James Holman Weir	E.E.	Natalie	Δ Υ
Edward Welles, Jr	G.S.	Wilkes-Barre	3 S.
Charles Stevenson Wheeler	L.	Newville	711 High
Jacob Herman Marcus Wiedenmann	E.E.	Wilkes-Barre	———
Thomas Arthur Williams	C.	Fullerton	143 P.
Joseph Gilliard Williamson	Ch.	Bloomsbury, N. J.	Home
William Henry Wilson	C.E.	Perth Amboy, N. J.	10 S.
Edwin Willard Woehling	C.E.	East Orange, N. J.	65 B.
Norman Howard Wolbach	L.	Easton	37 So. 13th
William Irwin Woodcock, Jr.	L.	Hollidaysburg	Φ Κ Ψ
Clark Ellis Woodring	E.E.	Hazleton	23 S.
Archie Scott Woods	M.E.	Easton	Chestnut and Cattell
Russell Holcombe Wyckoff	C.E.	Flemington, N. J.	48 S.
James Simpson Young	L.	Wood Ridge, N. J.	637 High

FRESHMEN 233

ABBREVIATIONS FOR BUILDING AND COURSES OF STUDY.

Brd.—Brainerd Hall.
B.—Blair Hall.
E.—East Hall.
F.—Fayerweather Hall.
K.—Knox Hall.
M.—Martien Hall.
McC.—McCartney St.
McK.—McKeen Hall.
N.—Newkirk Hall.
P.—Powell Hall.
S.—South College.
Δ *Κ Ε*—Fraternity House.
Σ Χ—Fraternity House.
Θ Δ *Χ*—Fraternity House.
Φ Δ *Θ*—Fraternity House.
Φ Κ Ψ—Fraternity House.
Ζ Ψ—Fraternity House.
Χ Φ—Fraternity House.
Δ *Υ*—Fraternity House.

C.—Classical.
C.E.—Civil Engineering.
Ch.—Chemical.
E.E.—Electrical Engineering.
E.M.—Mining Engineering.
G.S.—General Scientific.
L.—Latin Scientific.
M.E.—Mechanical Engineering.

† Reciting on schedule.

SUMMARY.

Courses.	Seniors.	Juniors.	Sophomores.	Freshmen.	Total.
Graduates	...	...	...	...	18
Classical	16	14	12	12	54
Latin Scientific	28	34	48	70	180
General Scientific	4	8	13	34	59
Civil Engineering	10	19	22	40	91
Electrical Engineering	10	10	21	28	69
Mining Engineering	4	2	6	4	16
Mechanical Engineering	..	6	5	13	24
Chemical	16	7	20	32	75
Totals	88	100	147	233	586

CLASSIFICATION BY RESIDENCE (Non-graduates).

California	1	Michigan	2	Wyoming	1
Connecticut	2	New Hampshire	1	Canada	1
Delaware	1	New Jersey	126	China	1
Dist. of Columbia	17	New York	49	Greece	1
Indiana	2	Ohio	14	Ireland	1
Iowa	1	Pennsylvania	332	South America	2
Maryland	8	South Dakota	1		
Massachusetts	2	Texas	2		

For further information, address "The Registrar, Lafayette College, Easton, Pennsylvania."

VOL. 8, NO. 2 FEBRUARY, 1914

BULLETIN

OF

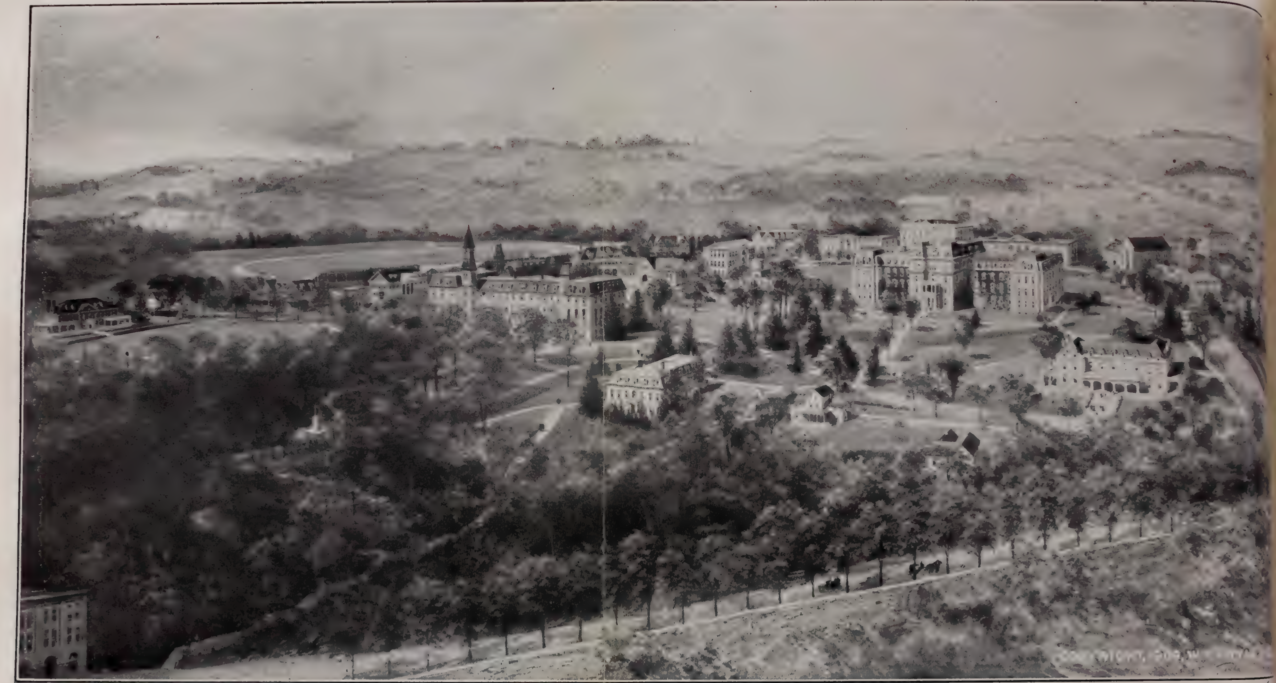
LAFAYETTE COLLEGE

GENERAL CATALOGUE
1913-1914

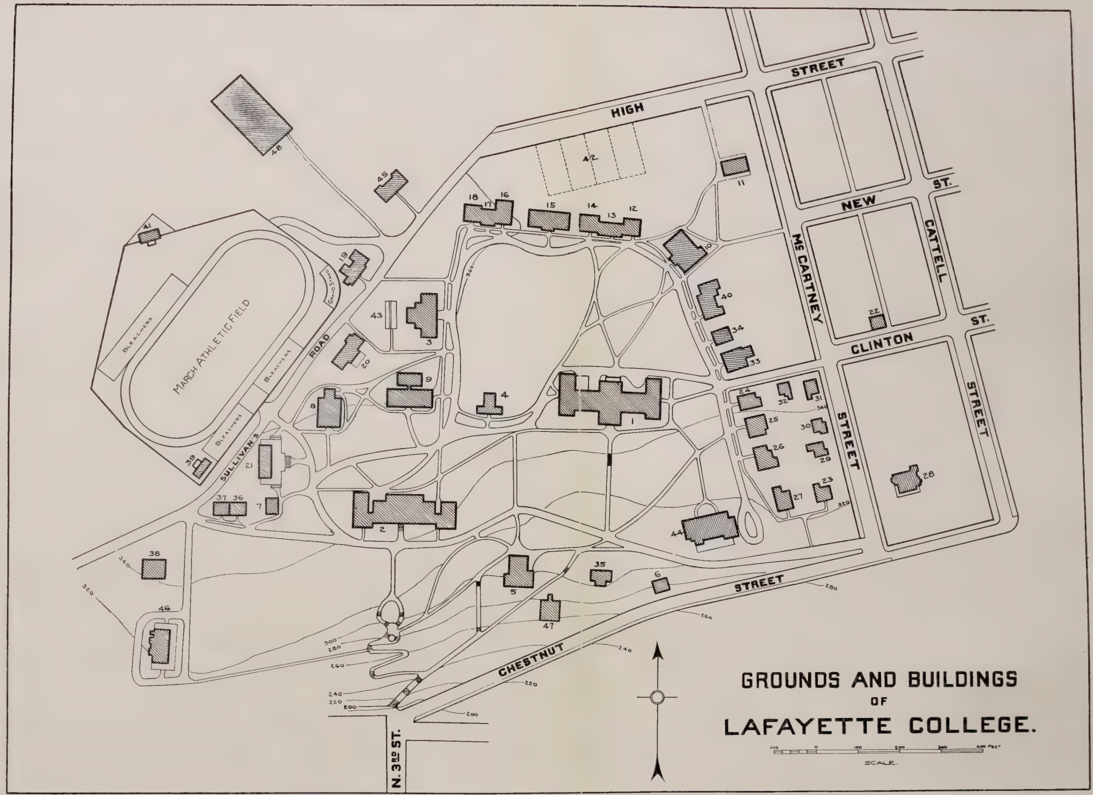
PUBLISHED QUARTERLY BY LAFAYETTE COLLEGE

Entered as second-class matter November 20, 1906, at Easton, Pennsylvania,
under the Act of Congress of July 16, 1894.

LAFAYETTE COL



LAFAYETTE COLLEGE, EASTON, PENNSYLVANIA.



GROUNDS AND BUILDINGS OF LAFAYETTE COLLEGE.

1 Pardee Hall.
2 South College.
3 Gayley Hall of Chemistry.
4 Observatory.
5 Jenks Biological Laboratory.
6 Private Laboratory.
7 College Office.
8 Gymnasium.
9 Van Wickle Library
10 Brainerd Hall.
11 East Hall.
12 Powell Hall.
13 Fayerweather Hall.
14 Martien Hall.
15 McKeen Hall.
16 Newkirk Hall.
17 Knox Hall.
18 Blair Hall.
19 Delta Kappa Epsilon.
20 Phi Delta Theta.
21 Theta Delta Chi.
22 Sigma Chi.
23 Prof. Davison.
24 Prof. Youngman.
25 Prof. Hardy.
26 Prof. Hall.
27 Prof. Lyle.
28 President Warfield.
29 Prof. Peck.
30 Prof. Owen.
31 Prof. Wysor.
32 Prof. Raschen.
33 Prof. Coffin.
34 Prof. March, Jr.
35 Prof. Hart.
36 Prof. Martin.
37 Prof. Rankin.
38—
39 Field House.
40 Delta Upsilon.
41 Field House.
42 Tennis Courts.
43 Greenhouse.
44 Zeta Psi.
45 Phi Kappa Psi.
46 Chi Phi.
47 Central Heating Plant.
48 Mechanical Eng. Bldg.

---

2 and 11 to 18—Dormitories

BULLETIN OF
LAFAYETTE COLLEGE

INCLUDING THE COURSES OF STUDY

IN THE

CLASSICAL *and* SCIENTIFIC DEPARTMENTS

AND THE

Departments of Civil, Mining, Electrical, and Mechanical Engineering and of Chemistry

EIGHTY-SECOND YEAR
1913-1914

EASTON, PENNSYLVANIA
1914

CONTENTS.

Absences and Re-examinations........ 146
Admission........ 15
Advanced Standing........ 25
Alphabetical Subject Index........ 31
Alumni Association........ 186
Attendance........ 145
Bequests and Devises........ 175
Buildings........ 157
Calendar........ 6
Chemical Course........ 85
Civil Engineering Course........ 54
Classical Course........ 38
College Officers........ 14
Commencement........ 152
Course Numbers........ 28
Courses of Study........ 27
Degrees........ 153
Degrees Conferred 1913........ 181
Dormitories........ 161
Electrical Engineering Course........ 71
Expenses........ 169
Faculty........ 9
General Scientific Course........ 47
Graduation........ 151
Lafayette College........ 7
Latin Scientific Course........ 46
Libraries........ 164
Matriculation........ 26
Mechanical Engineering Course........ 78
Medical Treatment........ 154
Mining Engineering Course........ 63
Prizes........ 176
Prizes Awarded 1913........ 183
Religious Instruction........ 154
Societies........ 167
Students........ 189
Terms........ 156
Theses........ 184
Trustees........ 8
Vacations........ 156
Y. M. C. A........ 162

1913

JULY

S	M	T	W	T	F	S
...	...	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	...	...
...	...	...	...	...	...	...

AUGUST

S	M	T	W	T	F	S
...	...	...	...	...	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	...	...	...	...	...	...

SEPTEMBER

S	M	T	W	T	F	S
...	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	...	...	...	...
...	...	...	...	...	...	...

OCTOBER

S	M	T	W	T	F	S
...	...	...	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	...
...	...	...	...	...	...	...

NOVEMBER

S	M	T	W	T	F	S
...	...	...	...	...	...	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	...	...	...	...	...	...

DECEMBER

S	M	T	W	T	F	S
...	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	...	...	...
...	...	...	...	...	...	...

1914

JANUARY

S	M	T	W	T	F	S
...	...	...	...	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
...	...	...	...	...	...	...

FEBRUARY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
...	...	...	...	...	...	...
...	...	...	...	...	...	...

MARCH

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	...	...	...	...
...	...	...	...	...	...	...

APRIL

S	M	T	W	T	F	S
...	...	...	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	...	...
...	...	...	...	...	...	...

MAY

S	M	T	W	T	F	S
...	...	...	...	...	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	...	...	...	...	...	...

JUNE

S	M	T	W	T	F	S
...	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	...	...	...	...
...	...	...	...	...	...	...

JULY

S	M	T	W	T	F	S
...	...	...	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	...
...	...	...	...	...	...	...

AUGUST

S	M	T	W	T	F	S
...	...	...	...	...	...	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	...	...	...	...	...

SEPTEMBER

S	M	T	W	T	F	S
...	...	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	...	...	...
...	...	...	...	...	...	...

OCTOBER

S	M	T	W	T	F	S
...	...	...	...	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
...	...	...	...	...	...	...

NOVEMBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	...	...	...	...	...
...	...	...	...	...	...	...

DECEMBER

S	M	T	W	T	F	S
...	...	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	...	...
...	...	...	...	...	...	...

1915

JANUARY

S	M	T	W	T	F	S
...	...	...	...	...	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	...	...	...	...	...	...

FEBRUARY

S	M	T	W	T	F	S
...	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	...	...	...	...	...	...
...	...	...	...	...	...	...

MARCH

S	M	T	W	T	F	S
...	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	...	...	...
...	...	...	...	...	...	...

APRIL

S	M	T	W	T	F	S
...	...	...	...	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	...
...	...	...	...	...	...	...

MAY

S	M	T	W	T	F	S
...	...	...	...	...	...	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	...	...	...	...	...

JUNE

S	M	T	W	T	F	S
...	...	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	...	...	...
...	...	...	...	...	...	...

CALENDAR.

1913—Sept. 18—9.45 A.M., Thursday, College year began.
*Oct. 15—Wednesday, Founders' Day.
*Nov. 27—Thursday, Thanksgiving Day.
Dec. 20—12 M., Saturday, First term ended.
1914—Jan. 8—9.45 A.M., Thursday, Second term began.
*Jan. 29—Chapel Services at 11 A.M., Thursday, Day of Prayer for Colleges.
*Feb. 18—Wednesday, Junior Week holiday.
Mar. 18—4 P.M., Wednesday, Second term ends.
Apr. 2—9.45 A.M., Thursday, Third term begins.
May 21–27—Final examinations of Senior class.
*May 30—Saturday, Memorial Day.
June 9–13—Examination of three lower classes.
June 14—10.30 A.M., Sunday, Baccalaureate Sermon. 8 P.M., Sunday, Sermon before Brainerd Society.
June 15—2 P.M., Monday, Senior Class Day Exercises.
June 16—Tuesday, Alumni Day.
June 17—9.45 A.M., Wednesday, Commencement Exercises.
Sept. 14—9 A.M. to 12 M., 2 P.M. to 4 P.M., Monday, Registration for entrance.
Sept. 15–16—9 A.M., Tuesday, Wednesday, Examinations for admission. Re-examinations, three upper classes.
Sept. 17—9.45 A.M., Thursday, College year begins.
*Oct. 21—Exercises at 11 A.M., Wednesday, Founders' Day.
*Nov. 26—Thursday, Thanksgiving Day. (Recess, November 25, 12 M., Wednesday, to November 27, 9.45 A.M., Friday.)
Dec. 23—4 P.M., Wednesday, First term ends.

* No recitations.

LAFAYETTE COLLEGE.

Lafayette College is situated at Easton, Pa., upon a site of remarkable beauty, overlooking the confluence of the Delaware and Lehigh rivers. It is thoroughly furnished with the buildings and apparatus to do the work of a progressive college and polytechnic school, and also with the equipment, so important in this age, for a healthful and wholesome student life. Its large and able faculty represent the best traditions of scholarship as well as the recent extensions of scientific knowledge and the newer methods of research. It frankly recognizes its obligation to give its students training, as well as the opportunities for acquiring knowledge, and to make its discipline include moral and spiritual culture. Recent revisions of the requirements for admission and of the courses of study have been made. It will be found that these changes meet the demands of the day for liberty of choice without sacrificing the supreme consideration of thoroughness.

Easton is a railroad center and easily accessible from all directions. It is about seventy-five miles from New York, seventy from Philadelphia, eighty from Scranton and one hundred from Wilkes-Barre and Harrisburg. The Lehigh Valley, Pennsylvania, N. J. Central, Phila. & Reading, D. L. & W., and L. & H. Railways afford convenient and rapid facilities for railway travel. It is also an important industrial center, and there are many advantages afforded the students in the Technical courses by its location. Its situation insures the most perfect conditions for the promotion of health.

TRUSTEES.

John Welles Hollenback, Esq.	Wilkes-Barre, Pa.
Hon. William S. Kirkpatrick, LL.D.	Easton, Pa.
Rev. Ethelbert D. Warfield, D.D., LL.D.	Easton, Pa.
Isaac P. Hand, Esq.	Wilkes-Barre, Pa.
James Gayley, M.E., Sc.D.	New York City
*Robert Snodgrass, LL.D.	Harrisburg, Pa.
Rev. D. J. Waller, Jr., Ph.D., D.D.	Bloomsburg, Pa.
Israel P. Pardee, M.E.	Hazleton, Pa.
Charles B. Adamson, M.S.	Philadelphia, Pa.
J. Renwick Hogg, A.M.	Philadelphia, Pa.
McCluney Radcliffe, M.D.	Philadelphia, Pa.
Rev. Leighton W. Eckard, D.D.	Philadelphia, Pa.
Edgar M. Green, M.D.	Easton, Pa.
John Markle, M.E.	Jeddo, Pa.
**Joseph De Forest Junkin, Esq.	Philadelphia, Pa.
Edward J. Fox, Esq.	Easton, Pa.
David Bennett King, Esq.	New York City
Nathan Grier Moore, Esq.	Chicago, Ill.
William E. Baker, C.E.	New York City
Horace P. Glover, Esq.	Mifflinburg, Pa.
Rev. J. Balcom Shaw, D.D., LL.D.	Los Angeles, Cal.
Rev. John B. Laird, D.D.	Frankford, Pa.
Simon Cameron Long, C.E.	Philadelphia, Pa.
John E. Fox, Esq.	Harrisburg, Pa.
A. C. Overholt, B.S.	Scottdale, Pa.
Wayne Dumont, Esq.	Paterson, N. J.
Rev. Albert J. Weisley, D.D.	Scranton, Pa.
Emery J. Kerrick, C.E.	Germantown, Pa.
William A. May, A.M., C.E.	Scranton, Pa.

John Welles Hollenback, *President*	Wilkes-Barre, Pa.
William S. Kirkpatrick, *Vice-President*	Easton, Pa.
Charles B. Green, *Secretary and Treasurer*	Easton, Pa.

MEETINGS OF THE TRUSTEES.

Thursday, February 12, 1914	WINTER MEETING.
Thursday, May 7, 1914	SPRING MEETING.
Monday, June 15, 1914	COMMENCEMENT WEEK.
Wednesday, October 21, 1914	FOUNDERS' DAY.

* Died November 8, 1913.

** Resigned October 15, 1913.

FACULTY

REV. ETHELBERT D. WARFIELD, D.D., LL.D.,
President, Professor of History and Political Science.
(John I. Blair Foundation.)

REV. ROBERT BARBER YOUNGMAN, A.M., PH.D.,
Emeritus Professor of the Greek Language and Literature.

REV. SELDEN JENNINGS COFFIN, A.M., PH.D., Retired.
(James H. Coffin Professorship of Astronomy.)

JOSEPH JOHNSTON HARDY, A.M. PH.D.,
Professor of Mathematics and Astronomy.
(George Hollenback Professorship of Mathematics.)

WILLIAM BAXTER OWEN, A.M., PH.D., LITT.D.,
Professor of the Latin Language and Literature.

EDWARD HART, PH.D ,
Dean of the Pardee Scientific Department, Professor of Analytical Chemistry.
(William Adamson Professorship of Analytical Chemistry.)

JAMES MADISON PORTER, C.E.,
Professor of Civil Engineering.

FRANCIS A. MARCH, JR., A.M., PH.D.,
Professor of the English Language.
(Francis A. March Professorship.)

WILLIAM SHAFER HALL, C.E., E.M., M.S.,
Professor of Technical Mathematics.

EDGAR MOORE GREEN, A.M., M.D.,
Consulting Physician in the Department of Physical Training.

ALVIN DAVISON, A.M., PH.D.,
Professor of Biology.
(Jesse Chamberlain Professorship of Botany.)

FREDERICK BURRITT PECK, PH.D.,
Professor of Mineralogy and Geology.

JOHN FREDERICK LOUIS RASCHEN, A.M., LITT.D.,
Professor of Modern Languages.

CLARENCE McCHEYNE GORDON, PH.D.,
Professor of Physics.

ALLAN ROBERTS, PH.B., M.S.,
Professor of History.

JAMES WADDELL TUPPER, PH.D.,
Professor of English Literature.

JAMES THERON ROOD, PH.D.,
Professor of Electrical Engineering.

WILLIAM THOMAS LYLE, C.E.,
Professor of Municipal Engineering.

EDWIN MOORE RANKIN, A.M., PH.D.,
Professor of Greek.

EDWIN OBERLIN FITCH, JR., M.S.,
Professor of Mechanical Engineering.

HENRY WYSOR, B.S.,
Professor of Metallurgy.

OTHO McCARROLL GRAVES, B.S. in C.E.,
Professor of Graphics.

REV. SAMUEL ALBERT MARTIN, A.M., D.D.,
Professor of Mental and Moral Philosophy.
(James Renwick Hogg Professorship.)

JAMES BRYANT HOPKINS, A.M.,
Assistant Professor of Romance Languages.

WILLIAM BENJAMIN MARQUARD, E.M.,
Assistant Professor of Mining Engineering.
(George B. Markle Professorship.)

JOSEPH FRAZIER LEWIS, B.S. in E.E.,
Assistant Professor of Electrical Engineering.

JAMES HENRY DELONG, B.S.,
Instructor in Chemistry.

REV. ROBERT ROBINSON, A.M.,
Instructor in Hebrew.

WILLIAM HUNTINGTON KIRKPATRICK, A.B.,
Instructor in Municipal Law.

RAYMOND HENRY LACEY, A.M.,
Instructor in Latin.

HAROLD ANSON BRUCE,
Director of Physical Training.

WILLIAM TRUMBOWER FOSTER, PH.B., M.S.,
Instructor in Biology.

D. ARTHUR HATCH, E.M.,
Instructor in Mathematics.

JOHN CAWLEY, B.S.,
Instructor in Mathematics.

A. HENRY FRETZ, PH.B., C.E.,
Instructor in Geology and Mineralogy.

HARRY THOMAS SPENGLER, C.E.,
Instructor in Surveying and Railroad Engineering.

JACOB EDWARD BOETHIUS, A.M.,
Instructor in Modern Languages.

HUBERT EVELYN BRAY, A.B.,
Instructor in Mathematics.

HAROLD JOHN LOCKWOOD, E.E.,
Instructor in Physics.

ATCHESON LAUGHLIN HENCH, A.B.,
Instructor in English.

WILLIAM SHANNON LOHR, B.S. in C.E.,
Instructor in Civil Engineering.

CLIFFORD ELLIOTT WILLIAMS, B.S. in C.E.,
Instructor in Cement Engineering.

SAMUEL KAY HASLAM,
Instructor in Machine Shop.

ARTHUR DODD SNYDER, A.B.,
Instructor in Mathematics.

ELBERT ROSS, B.S. in CHEM.,
Instructor in Chemistry.

THOMAS ARMSTRONG GARRETSON, B.S. in CHEM.,
Instructor in Chemistry.

GILBERT NICKEL, A.B.,
Instructor in Latin and English:

CHARLES GARFIELD EICHLIN, A.B.,
Instructor in Physics.

HERBERT HENRY EICHLIN, A.B.,
Instructor in Mathematics and History.

ALFRED ROBB BAILEY, A.B.,
Instructor in Modern Languages.

RAYMOND VON DERSMITH GABLE, A.M.,
Instructor in Modern Languages.

FRED WILLIAM SLANTZ, B.S. in C.E.,
Instructor in Graphics.

HENRY CLINTON HUTCHINS, A.M.,
Instructor in English.

EDGAR COLBY KNOWLTON, A.M.,
Instructor in English.

LESHER WHARTON VANBUSKIRK, B.S. in C.E.,
Instructor in Civil Engineering.

MARK BALDERSTON, A.B.,
Instructor in Physics.

CLINTON ELLICOTT PEARCE, B.S.,
Instructor in Mechanical Engineering.

CHARLES R. WASSER,
Instructor in Pattern Shop.

WILLIAM WALLAESA,
Instructor in Foundry.

ARTHUR LEONARD LOGAN,
Instructor in Forge.

REV. ADOLPH A. SCHWARZ,
Instructor in German.

COLLEGE OFFICERS.

William S. Hall, C.E., E.M., M.S.,
Clerk.

William T. Lyle, C.E.,
Inspector of Buildings.

Rev. John F. Stonecipher, D.D.,
Librarian.

Rev. Maurice A. Filson, A.M.,
Assistant in Library.

Edward Hart, Ph.D.,
Curator of Gayley Hall, and Librarian of the Henry W. Oliver Library.

Charles B. Green, E.M.,
Registrar and Treasurer.

Albert Moore Lane, Ph.B.,
Bursar.

John Edgar Fretz, A.M., M.D.,
Physician.

Deans.

College	Professor Roberts.
Senior Class	The President.
Junior Class	Professors Peck and Martin.
Sophomore Class	Professors Owen and Hall.
Freshman Class	Professors Hardy, Raschen, Hopkins and Mr. Cawley.

LAFAYETTE COLLEGE.

ADMISSION.

Every applicant for admission to the College is expected to report at the College offices and register immediately on his arrival. Before registering he must submit to the Registrar a satisfactory certificate of moral character from some person known to the College authorities, and a diploma or certificate of graduation from the school which he last attended, or, if he be not a graduate, a statement that he leaves the school with the approval of its principal and is honorably dismissed to this College, with a statement of the studies which he has pursued and the course which he desires to pursue. His application having been approved he is admitted to the examinations. Examinations are regularly held on the day following the annual commencement day in June, and the days preceding the first day of the Autumn term in September, and also on the first day of the second and third terms.

It is expected that every applicant for admission shall have pursued a four-year course of study in a high school or college preparatory school and shall have successfully completed his course of study representing an equivalent of sixteen hours per week for the four years. The specific requirements for the various courses are not intended to entirely cover all of the secondary school work, especially in the Technical and General Scientific Courses, but only to represent such preparation as is indispensable to enable a student to carry on the studies which are to be pursued in those courses. It is expected that the certificate of study brought by each student will fully set forth the studies which he has pursued during his secondary school course.

Requirements for Admission to the Freshman Class.

CLASSICAL COURSE.

Candidates are examined in the following subjects:

Geography.
History (A), (B) and (C).
Mathematics (A).
English.
Latin.
Greek.

(For details of subjects see pages 17–24.)

LATIN SCIENTIFIC COURSE.

Candidates are examined in the following subjects:

Geography.
History (A), (B) and (C).
Mathematics (A).
Physics or Chemistry.
English.
Latin.
German (A) and (B) or French (A) and (B).

(Candidates for the Classical and Latin Scientific Course offering Mathematics (A) and (B) can take advanced courses in Mathematics.)

GENERAL SCIENTIFIC COURSE.

Candidates are examined in the following subjects:

Geography.
History (A), (B) and (C).
Mathematics (A).
Physics or Chemistry.
English.
German (A) and (B) or French (A) and (B).

and one of the following subjects: Mathematics (B); a Second Modern Language (A) and (B); Latin Grammar, 4 books of Caesar and 2 orations of Cicero or an equivalent.

CIVIL, MINING, ELECTRICAL AND MECHANICAL ENGINEERING AND CHEMICAL COURSES.

Candidates are examined in the following subjects:

Geography (A).
History (A), (B) and (C).
Mathematics (A) and (B).
Physics or Chemistry.
English.
German (A) and (B) or
French (A) and (B).

DETAILS OF REQUIREMENTS FOR ADMISSION.

GEOGRAPHY.—It is expected that every applicant shall have had a full course in Political Geography and at least an introductory course in Physical Geography. This requirement need not be met by the secondary school if it has been previously complied with. For the Scientific courses, however, the more advanced study of Physical Geography or Physiography is recommended, and the candidate will receive full credit for such study.

HISTORY.

(A) ANCIENT HISTORY.—A short introduction setting forth the history of the earliest civilizations with particular study of Greek and Roman History down to the fall of Rome. The following books are recommended: Myers' "Rome, Its Rise and Fall;" Morey's, Leighton's or Allen's Roman History and Morey's or Oman's Greek History.

(B) MEDIAEVAL AND MODERN HISTORY.—Beginning with the results of the great Germanic invasions of Western Europe and tracing the rise of Modern History through the French Revolution epoch. Courses A and B are intended to constitute a course in General History and to give the student a general view of the development of modern civilization and fit him to pursue college courses in history, science, and philosophy with an intelligent understanding of the development of modern life and thought.

(C) AMERICAN HISTORY AND CIVIL GOVERNMENT.—The study of American History may be pursued prior to the secondary school and work done in the grammar grades will be accepted where there is evidence that it has been well done, but it is recommended that it should be a part of the secondary school course. The books of Fiske, McMaster and Johnston are recommended.

(D) English History.—A detailed study of the History of England will be accepted as a part of the secondary school preparation but it is not specially required for any of the regular courses of this College and will not be accepted as a substitute for A and B.

Mathematics (A).—*Arithmetic:* Complete, including the Metric System.

Algebra: Fundamental principles. Factoring. Fractions. Simple Equations. Involution. Evolution. Exponents. Quadratic Equations. Simultaneous Quadratic Equations. Equations Solved as Quadratics. Properties of Quadratic Equations.

Geometry: Plane Geometry entire; as in Wentworth, Wells or Loomis.

Mathematics (B).—*Solid Geometry.*

Algebra: Surds and Imaginaries. Simple Indeterminate Equations. Inequalities. Ratio. Proportions and Variations. Progressions.

Plane Trigonometry: Through the solution of right and oblique triangles (Hall and Funk's Trigonometry or an equivalent); candidates should bring their logarithmic tables to the examination.

Physics.—The elementary principles (Millikan and Gale, Hall and Bergen; Carhart and Chute, Mann and Twiss or Hoadley).

Chemistry.—Elements of Inorganic Chemistry.

English.—The requirements are based on the recommendations of the Conference on Uniform Entrance Requirements in English. These recommendations are as follows:

The study of English in school has two main objects: (1) command of correct and clear English, spoken and written; (2) ability to read with accuracy, intelligence, and appreciation.

GRAMMAR AND COMPOSITION.

The first object requires instruction in grammar and composition. English grammar should ordinarily be reviewed in the secondary school; and correct spelling and grammatical accuracy should be rigorously exacted in connection with all written work during the four years. The principles of English composition governing punctuation, the use of words, sentences, and paragraphs should be thoroughly mastered; and practice in composition, oral as well as written, should extend throughout the secondary school period. Written exercises may well comprise letter-writing, narration, description, and easy exposition and argument. It is advisable that subjects for this work be taken from the student's personal experience, general knowledge, and studies other than English, as well as from his reading in literature. Finally, special instruction in language and composition should be accompanied by concerted effort of teachers in all branches to cultivate in the student the habit of using good English in his recitations and various exercises, whether oral or written.

LITERATURE.

The second object is sought by means of two lists of books, headed respectively *Reading* and *Study*, from which may be framed a progressive course in literature covering four years. In connection with both lists, the student should be trained in reading aloud and be encouraged to commit to memory some of the more notable passages both in verse and in prose. As an aid to literary appreciation, he is further advised to acquaint himself with the most important facts in the lives of the authors whose works he reads and with their place in literary history.

A. READING.

The aim of this course is to foster in the student the habit of intelligent reading and to develop a taste for good literature, by giving him a first-hand knowledge of some of its best specimens. He should read the books carefully, but his attention should not be so fixed upon details that he fails to appreciate the main purpose and charm of what he reads.

With a view to large freedom of choice, the books provided for reading are arranged in the following groups, from each of which at least two selections are to be made, except as otherwise provided under Group I.

Books to be read: 1914 (two to be selected from each group).

Group I. The *Old Testament*, comprising at least the chief narrative episodes in *Genesis*, *Exodus*, *Joshua*, *Judges*, *Samuel*, *Kings*, and *Daniel*, *together* with the books of *Ruth* and *Esther;* the *Odyssey*, with the omission, if desired, of Books I, II, III, IV, V, XV, XVI, XVII; the *Iliad*, with the omission, if desired, of Books XI, XIII, XIV, XV, XVII, XXI; Virgil's *Aeneid*. The *Odyssey*, *Iliad* and *Aeneid* should be read in English translations of recognized literary excellence.

For any unit of this group a unit from any other group may be substituted.

Group II. Shakespeare's *Merchant of Venice; Midsummer Night's Dream; As You Like It; Twelfth Night; Henry the Fifth; Julius Caesar.*

Group III. Defoe's *Robinson Crusoe*, Part I; Goldsmith's *The Vicar of Wakefield;* Scott's *Ivanhoe* or *Quentin Durward;* Hawthorne's *The House of the Seven Gables;* Dickens's *David Copperfield* or *A Tale of Two Cities;* Thackeray's *Henry Esmond;* Mrs. Gaskell's *Cranford;* George Eliot's *Silas Marner;* Stevenson's *Treasure Island.*

Group IV. Bunyan's *Pilgrim's Progress*, Part I; *The Sir Roger de Coverley Papers* in "The Spectator;" Franklin's *Autobiography* (condensed); Irving's *Sketch Book;* Macaulay's *Lord Clive* and *Warren Hastings;* Thackeray's *English Humorists;* selections from Lincoln, including at least the two *Inaugurals*, the *Speeches in Independence Hall* and *at Gettysburg*, the *Last Public Address*, and the *Letter to Horace Greeley*, along with a brief memoir or estimate; Parkman's *Oregon Trail;* either Thoreau's *Walden*, or Huxley's *Autobiography* and selections from *Lay Sermons*, including the addresses on *Improving Natural Knowledge*, *A Liberal Education*, and *A Piece of Chalk;* Stevenson's *An Inland Voyage* and *Travels with a Donkey.*

Group V. Palgrave's *Golden Treasury* (First Series), Books II and III, with especial attention to Dryden, Collins, Gray, Cowper, and Burns; Gray's *Elegy in a Country Churchyard* and Goldsmith's *The Deserted Village;* Coleridge's *The Ancient Mariner* and Lowell's *The Vision of Sir Launfal;* Scott's *The Lady of the Lake;* Byron's *Childe Harold*, Canto IV, and *The Prisoner of Chillon;* Palgrave's *Golden Treasury* (First Series), Book IV, with especial attention to Wordsworth, Keats and Shelley; Poe's *The Raven*, Longfellow's *The Courtship of Miles Standish*, and Whittier's *Snow-Bound;* Macaulay's *Lays of Ancient Rome* and Arnold's *Sohrab and Rustum;* Tennyson's *Gareth and Lynette*, *Lancelot and Elaine*, and *The Passing of Arthur;* Browning's *Cavalier Tunes*, *The Lost Leader*, *How They Brought the Good News from Ghent to Aix*, *Home Thoughts from Abroad*, *Home Thoughts from the Sea*, *Incident of the French Camp*, *Herve Riel*, *Pheidippides*, *My Last Duchess*, *Up at a Villa—Down in the City.*

Books to be read: 1915–19.

Group I.—Classics in Translation. The *Old Testament*, comprising at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings, and Daniel, together with the books of Ruth and Esther. The *Odyssey*, with the omission, if desired, of Books I, II, III, IV, V, XV, XVI, XVII. The *Iliad*, with the omission, if desired, of Books XI, XIII, XIV, XV, XVII, XXI. The *Aeneid*. The *Odyssey*, *Iliad* and *Aeneid* should be read in English translations of recognized literary excellence. For any selection from this group a selection from any other group may be substituted.

Group II.—Shakespeare. *Midsummer-Night's Dream, Merchant of Venice, As You Like It, Twelfth Night, The Tempest, Romeo and Juliet, King John, Richard II, Richard III, Henry V, Coriolanus, Julius Caesar, Macbeth, Hamlet.*

Group III.—Prose Fiction. Malory: *Morte d'Arthur* (about 100 pages); Bunyan: *Pilgrim's Progress, Part I;* Swift: *Gulliver's Travels* (voyages to Lilliput and to Brobdingnag); Defoe: *Robinson Crusoe, Part I;* Goldsmith: *Vicar of Wakefield;* Frances Burney: *Evelina;* Scott's Novels: any *one;* Jane Austen's Novels: any *one;* Maria Edgeworth: *Castle Rackrent*, or *The Absentee;* Dickens's Novels: any *one;* Thackeray's Novels: any *one;* George Eliot's Novels: any *one* Mrs. Gaskell: *Cranford;* Kingsley: *Westward Ho!* or *Hereward, the Wake;* Reade: *The Cloister and the Hearth;* Blackmore: *Lorna Doone;* Hughes: *Tom Brown's Schooldays;* Stevenson's *Treasure Island*, or *Kidnapped*, or *Master of Ballantrae;* Cooper's Novels: any *one;* Poe: *Selected Tales;* Hawthorne: *The House of the Seven Gables*, or *Twice Told Tales*, or *Mosses from an Old Manse;* A collection of *Short Stories* by various standard writers.

Group IV.—Essays, Biography, Etc. Addison and Steele: *The Sir Roger de Coverley Papers*, or Selections from the *Tatler* and *Spectator* (about 200 pages); Boswell: Selections from the *Life of Johnson* (about 200 pages); Franklin: *Autobiography;* Irving: Selections from the *Sketch Book* (about 200 pages), or *Life of Goldsmith;* Southey: *Life of Nelson;* Lamb: Selections from the *Essays of Elia* (about 100 pages); Lockhart: Selections from the *Life of Scott* (about 200 pages); Thackeray: Lectures on *Swift, Addison*, and *Steele* in the *English Humorists;* Macaulay: Any one of the following essays: *Lord Clive, Warren Hastings, Milton, Addison, Goldsmith, Frederic the Great, Madame d'Arblay;* Trevelyan: Selections from the *Life of Macaulay* (about 200 pages); Ruskin: *Sesame and Lilies*, or *Selections* (about 150 pages); Dana: *Two Years before the Mast;* Lincoln: *Selections*, including at least the two Inaugurals, the Speeches in Independence Hall and at Gettysburg, the Last Public Address, the Letter to Horace Greeley; together with a brief memoir or estimate of Lincoln; Parkman: *The Oregon Trail;* Thoreau: *Walden;* Lowell: *Selected Essays* (about 150 pages); Holmes: *The Autocrat of the Breakfast Table;* Stevenson: *An Inland Voyage* and *Travels with a Donkey;* Huxley: *Autobiography* and selections from *Lay Sermons*, including the addresses on *Improving Natural Knowledge, A Liberal Education*, and *A Piece of Chalk;* A collection of *Essays* by Bacon, Lamb, De-Quincey, Hazlitt, Emerson, and later writers; a collection of *Letters* by various standard writers.

Group V.—Poetry. Palgrave's *Golden Treasury* (*First Series*), *Books I and III*, with special attention to Dryden, Collins, Gray, Cowper, and Burns; Palgrave's *Golden Treasury* (*First Series*), *Book IV*, with special attention to Wordsworth, Keats, and Shelley (if not chosen for study under B).; Goldsmith: *The Traveller* and *The Deserted Village;* Pope: *The Rape of the Lock;* A collection of English and Scottish *Ballads*, as, for example, some *Robin Hood* ballads, *The Battle of Otterburn, King Estmere, Young Beichan, Bewick and Grahame, Sir Patrick Spens*, and a selection from later ballads; Coleridge: *The Ancient Mariner, Christabel*, and *Kubla Khan;* Byron: *Childe Harold, Canto III* or *IV*, and *The Prisoner of Chillon;* Scott: *The Lady of the Lake*, or *Marmion;* Macaulay: *The Lays of Ancient Rome, The Battle of Naseby, The Armada Ivry;* Tennyson: *The Princess*, or *Gareth and Lynette, Lancelot and Elaine*, and *The Passing of Arthur;* Browning: *Cavalier Tunes, The Lost Leader, How They Brought the Good News from Ghent to Aix, Home Thoughts from Abroad, Home Thoughts from the Sea, Incident of the French Camp, Hervé Riel, Pheidippides, My Last Duchess, Up at a Villa—Down in the City, The Italian in England, The Patriot, The Pied Piper, "De Gustibus—", Instans Tyrannus;* Arnold: *Sohrab and Rustum*, and *The Forsaken Merman;* Selections from *American Poetry*, with special attention to Poe, Lowell, Longfellow, and Whittier.

B. STUDY.

This part of the requirement is intended as a natural and logical continuation of the student's earlier reading, with greater stress laid upon form and style, the exact meaning of words and phrases, and the understanding of allusions.

Books to be studied: 1914. Shakespeare's *Macbeth;* Milton's *L'Allegro, Il Penseroso* and *Comus;* Burke's *Speech on Conciliation with America* or Washington's *Farewell Address* and Webster's *First Bunker Hill Oration;* Macaulay's *Life of Johnson* or Carlyle's *Essay on Burns*.

Books to be studied: 1915-19 (one to be selected from each group).

Group I.—Drama. Shakespeare: *Julius Caesar, Macbeth, Hamlet.*

Group II.—Poetry. Milton: *L'Allegro, Il Penseroso*, and either *Comus* or *Lycidas;* Tennyson: *The Coming of Arthur, The Holy Grail*, and *The Passing of Arthur;* The selections from Wordsworth, Keats, and Shelley in *Book IV* of Palgrave's *Golden Treasury* (*First Series*).

Group III.—Oratory. Burke: *Speech on Conciliation with America;* Macaulay's Two *Speeches on Copyright* and Lincoln's *Speech at Cooper Union;* Washington's *Farewell Address* and Webster's *First Bunker Hill Oration.*

Group IV.—Essays. Carlyle: *Essay on Burns*, with a selection from Burns' *Poems;* Macaulay: *Life of Johnson;* Emerson: *Essay on Manners.*

LATIN.—*Grammar:* The Roman method of pronunciation is used.

Caesar: *Commentaries*, four books, for a portion of which an equivalent in Nepos, Cicero's De Senectute or De Amicitia will be received.

Cicero: Orations, seven.

Virgil: Aeneid, six books, *Bucolics.*

Prose Composition: Daniell's or equivalent.

GREEK.—*Grammar:* The applicant should have a thorough acquaintance with the declensions of nouns, pronouns and adjectives and the conjugation of verbs. Especial emphasis is laid upon a familiarity with the forms of words and the essential principles of syntax. Pronunciation of words, with their written accents, should not be disregarded.

Prose Composition: Short sentences, based upon the *Anabasis*, will be set for translation from English into Greek. These are designed to test the applicant's knowledge of the important rules of syntax. (Collar and Daniell, or equivalent.)

Xenophin: Anabasis, four books, or an equivalent in the *Cyropaedia*. The student must be prepared to defend his translations of the passages set for examination.

Homer: Iliad, three books, or *Odyssey*, three books.

GERMAN (A).—An accurate knowledge of the principles of grammar, especially the inflection of articles, adjectives, pronouns, and nouns, the conjugation of the weak and strong verbs, the uses of the model auxiliaries; the prepositions and their government; the elementary rules of syntax and work order; to be able to read at sight ordinary German prose. It is believed that this requisite facility can be acquired by reading not less than two hundred duodecimo pages of simple German.

GERMAN (B).—This includes a thorough knowledge of accidence, of the elements of word-formation, and of the principal uses of the prepositions and conjunctions. The candidate should be familiar with the essentials of German syntax, and must possess the ability to translate into German easy English prose; to translate at sight passages from standard classical authors. The reading of at least three hundred and fifty pages in addition to that required under German (A) will develop such ability. For examination no specific authors or works are designated. Each candidate is required to bring a statement from his teacher, mentioning text-books used and authors read, including the number of pages translated.

FRENCH (A).—This embraces a thorough knowledge of the rudiments of grammar, including the inflection of the regular and the more common irregular verbs; the inflection of nouns and adjectives for gender and number; the uses of articles and partitive constructions; the forms and positions of personal pronouns; the uses of the other pronouns. Candidates should be able to read at sight ordinary modern prose. It is believed that this ability is acquired by reading two hundred duodecimo pages from the works of at least three different authors.

FRENCH (B).—Candidates should show a thorough knowledge of accidence, and a familiarity with the essentials of French syntax, especially the uses of the tenses, modes, prepositions and conjunctions. They must be able to translate into French a connected passage of simple English, and to translate at sight standard French authors. This proficiency may be acquired by reading, in addition to that required under French (A), not less than four hundred pages of the works of various standard authors. For examination no special authors or works are designated. Applicants should present a statement from their teachers setting forth the text-books used and the number of pages translated.

PARTIAL OR SPECIAL COURSES.

In addition to the courses above specified, students may be admitted under exceptional circumstances to pursue courses of study of a special character not leading to a degree. Such students are required to undergo such preliminary examination as may be deemed necessary to ascertain their fitness to pursue the proposed course. The examination will cover at least the requirements of some one of the regular courses if the student comes to College from a preparatory school. The needs of men of maturity who have been engaged in active pursuits and wish to fit themselves for more advanced work will be granted special consideration when the Faculty deem it wise. When admitted they are subject to the same rules and regulations and the same examinations in the studies pursued as are other undergraduates. On completing their course they will receive, on application, certificates of proficiency in such studies as they have satisfactorily completed.

ADVANCED STANDING.

Candidates for advanced standing are examined not only in the preparatory studies, but also specially in the previous studies of the class they wish to enter, or their full equivalents. No certificate from a preparatory school will be accepted as a substitute for college work.

Students from another College bringing certificates of rank and honorable dismissal are admitted to recite on trial with corresponding rank in this College, until there is sufficient test of their qualification for admission to regular standing. They will, however, be examined in the earlier studies of the course they enter which are not included in the curriculum of the College from which they come, unless there are full equivalents.

No student, whether from another College or not, will be admitted to the Senior class as a candidate for a degree after the beginning of the second term.

CONDITIONS.

Students who fail to pass in a part of the subjects in which they are examined may be admitted upon the condition that they pass a satisfactory examination on such subjects before the end of the term next after that in which they enter. The number of such conditions with which a student is admitted to the College will be determined in each case by a vote of the Faculty.

When a student is admitted upon the condition that he make up one or more deficiencies in a special delinquent class arranged by the College for the benefit of such students he will be required to pay a fee for such course in addition to other College charges.

CERTIFICATES.

Certificates of the Examination Board of the Association of Colleges and Preparatory Schools of the Middle States and Maryland, of the Regents of the University of the State of New York and of certain approved preparatory schools are received in lieu of examination for entrance. Certificates, which will be accepted only from graduates of regularly prescribed preparatory courses, must be signed by the principal and certify only to work done during school hours. They should be filed with the Registrar before the entrance examination in June. Blank certificates will be furnished upon application. Whenever the certificate does not cover one or more of the requirements of admission or supply a satisfactory equivalent, an examination upon such subject or subjects will be required. Such certificates will not be received after one year from the completion of the period of study for which they are given unless an additional certificate of continued study accompany them.

MATRICULATION.

No student is considered a regular member of the College until after his matriculation, which takes place thirty days after his entrance. During the interval between his admission and matriculation he is, however, in all respects subject to the laws of the College.

DESCRIPTION OF COURSES.

Three courses of study are offered in the Academic department leading to appropriate degrees. These courses have been carefully arranged so as to provide a thorough mental discipline and prepare the student to pursue to advantage the learned professions or to meet the requirements of a business career. The Freshman and Sophomore years are prescribed. The Junior and Senior years are half prescribed and half elective. A very wide choice of studies is provided both by the threefold arrangement of courses and by the numerous electives of the last two years. At the same time continuity and thoroughness are secured by the requirement of a large part of the curriculum.

The Technical courses are prescribed throughout. They are arranged so as to provide in the earlier years a general education of the kind that is indispensable for the successful pursuit of the engineering and chemical professions; and in the later years a thorough professional training.

Every student is expected to arrange a schedule of at least sixteen weekly exercises. These exercises are calculated on the basis of *periods*—the period being the equivalent of one recitation hour or three hours of drawing room, laboratory, or field work. A lecture which does not require previous preparation may be combined with two hours of practical work in a *period*.

The following courses of study are offered:

CLASSICAL COURSE.
Leading to the degree of A.B.

LATIN SCIENTIFIC COURSE WITH GREEK.
Leading to the degree of A.B.

LATIN SCIENTIFIC COURSE WITHOUT GREEK.
Leading to the degree of Ph.B.

GENERAL SCIENTIFIC COURSE.
Leading to the degree of B.S.

CIVIL ENGINEERING COURSE.
Leading to the degree of C.E.

MINING ENGINEERING COURSE.
Leading to the degree of E.M.

ELECTRICAL ENGINEERING COURSE.
Leading to the degree of E.E.

MECHANICAL ENGINEERING COURSE.
Leading to the degree of M.E.

CHEMICAL COURSE.
Leading to the degree of B.S. in Chemistry.

COURSE NUMBERS.

For description of courses see pages 91–144.

LANGUAGE AND LITERATURE.

1– 50	ENGLISH.
51– 70	ELOCUTION.
71–160	GERMAN AND ROMANCE LANGUAGES.
161–200	CLASSICS.
201–210	HEBREW.

HISTORY, POLITICAL SCIENCE, AND PHILOSOPHY.

221–250	BIBLE.
251–310	PHILOSOPHY.
311–340	HISTORY.
341–400	POLITICAL AND SOCIAL SCIENCE.

SCIENCE AND MATHEMATICS.

401–440	MATHEMATICS.
441–460	GRAPHICS.
461–490	PHYSICS.
491–530	GEOLOGY.
531–550	ASTRONOMY.
551–580	BIOLOGY AND HYGIENE.

CIVIL ENGINEERING.

601–610	SURVEYING.
611–620	RAILROADS.
621–630	MECHANICS.
631–640	ROADS AND PAVEMENTS.
641–650	MASONRY.
651–660	CEMENT AND CONCRETE.
661–670	HYDRAULICS.
671–680	SEWERAGE.
681–689	WATER SUPPLY.
690–698	ROOFS AND BRIDGES.
699–700	THESES.

MINING ENGINEERING.

701–705	MINE SURVEYING.
706–710	MINE EXPLORATION.
711–715	DEEP BORING.
716–720	DRILLING, BLASTING, AND AIR COMPRESSION.
721–725	SHAFT SINKING AND DRIFTING.
726–730	MINE EXPLOITATION.
731–735	MINE HAULAGE AND HOISTING.
736–740	MINE VENTILATION AND LIGHTING.
741–745	MINE DRAINAGE.
746–750	MINE CONSTRUCTION.

751–755	ORE DRESSING.
756–760	MINING LAW.
761–765	MINE MACHINERY.
766–770	MINE ADMINISTRATION.
771–775	THESES.

ELECTRICAL ENGINEERING.

801–810	GENERAL DIRECT CURRENT ENGINEERING.
811–820	GENERAL ALTERNATING CURRENT ENGINEERING.
821–830	ELECTRICAL LABORATORY.
831–840	ENGINEERING ABSTRACTS.
841–850	ELECTRICAL DESIGN.
851–860	ELECTRICAL POWER UTILIZATION.
861–870	ELECTRIC POWER TRANSMISSION.
871–880	ELECTRIC POWER GENERATION.
881–890	ELECTRICAL COMMUNICATION.
891–900	THESES.

CHEMISTRY.

901–950	CHEMISTRY.
951–960	METALLURGY.
961–970	TECHNICAL GERMAN.
971–980	THESES.

MECHANICAL ENGINEERING.

1001–1010	SHOP WORK.
1011–1020	DESIGN.
1021–1030	STEAM ENGINEERING.
1041–1050	GAS ENGINEERING.
1051–1060	HEATING AND VENTILATING.
1061–1070	INDUSTRIAL MANAGEMENT.
1071–1080	THESES.

ALPHABETICAL SUBJECT INDEX.

Numbers immediately following the subject refer to the courses of study, pages 91–144.

Numbers in parenthesis indicate the year and term in which the subject is given.

Page.

- Agricultural Chemistry 973 (IV, 2) 141
- Algebra 401–5 (I, 1–3) 113
- Alternating Current Engineering 811–12 (III, 1–2) 136
- American History 321–4 (II, 1–3; III, 2) 111
- Analytical Geometry 416–20 (I, 3; II, 1–2) 114
- Anatomy, Mammalian 551 (III, 1) 123
- Ancient History 311 (I–III) 110
- Anglo-Saxon 10 (II, 2) 92
  - 11–13 (III, 1–3; IV, 1–3) 92
- Assaying 955 (IV, 2) 141
- Astronomy
  - Descriptive 531 (IV, 1) 122
  - 536 (IV, 1) 122
  - Practical 541–2 (IV, 2–3) 122
  - For Engineers 543 (III–2) 122
- Bacteriology and Hygiene 554 (IV, 1) 124
- Bible
  - English 221–6 (I, II, 1–3) 108
  - Greek 227–9 (II, 1–3) 108
  - 236–8 (III, 1–3) 108
  - Latin 230–2 (II, 1–3) 108
  - 239–41 (III, 1–3) 108
  - History of 244 (IV, 1) 108
- Biology
  - General 553 (III, 3) 124
  - Sanitary 561 (III, 3) 125
- Blackstone 361–2 (IV, 2–3) 112
- Boilers 1021 (III, 1–2) 143
- Botany 571 (III, 1) 125
- Bridge Design 695–6 (IV, 2–3) 132
- Bridge Erection 697 (IV, 3) 132
- Business Law 363–4 (IV, 2–3) 112
- Calculus 426–7 (II, 1–2) 114
  - 429–31 (III, 1–3) 115
- Cement 651, 654 (III, 1) 130

Chemical Arithmetic ... 917 (II, 3) 139
Chemical Engineering ... 934 (IV, 1) 140
Chemical Technology ... 935 (IV, 2) 141
Chemistry
  Inorganic ... 901 (II, 3) 139
  911–12 (I, 1–2) 139
  Organic ... 908–10, (IV, 1–3) 920–2 (III, 1–3) 140
  Theoretical ... 919 (III, 1) 140
  924–5 (III, 2–3) 140
  Thesis Work ... 971–2 (IV, 2–3) 141
Church History ... 242–3 (IV, 2–3) 108
Comparative Government ... 351–3 (IV, 1–3) 112
Comparative Philology ... 30–1 (IV, 3) 94
Concrete ... 652–3, 655–6 (III, 2–3) 130
Constitutional History, United States, 341, 345–6 (III, 3; IV, 2–3) 111
Crystallography ... 493 (III, 3) 120
  495 (IV, 2) 120
  511 (III, 1) 120
Descriptive Geometry ... 451 (II, 1–3) 117
Differential Equations ... 432 (IV, 1) 115
  437 (II, 3) 115
Drawing ... 441 (I, 1–3) 116
Economics ... 371–2 (IV, 2–3) 112
Electrical Design ... 841–2 (IV, 1–2) 137
Electrical Laboratory ... 821–4 (III, 1–3; IV, 1) 136
  825–8 (III, 2–3; IV, 2–3) 137
Electrical Power Stations ... 871 (IV, 2) 138
Electrical Power Transmission ... 861 (IV, 1) 138
Electrical Problems ... 806–7 (III, 1–2) 136
Electric Railroad ... 853 (IV, 3) 138
Elements of Electrical Engineering ... 804 (III, 1) 135
Elocution ... 51–2 (I, 2–3) 94
  53–5 (II, 1–3) 94
  56–8 (III, 1–3) 94
  59–61 (IV, 1–3) 95
Embryology and Histology ... 556 (IV, 3) 125
Engineering Abstracts ... 831 (III, 1–3; IV, 1–3) 137
English Composition and Rhetoric ... 1–3 (I, 1–3) 92
English for Technical Students ... 4–6 (IV, 1–3) 92
English History ... 331–2 (III, 1–2) 111

English Language
  Bacon........................19 (III, 1) 93
  Bunyan........................16 (II, 1) 93
  Chaucer........................18 (II, 3) 93
  Drama....................23–4 (IV, 2–3) 93
  Fiction....................22–4 (IV, 1–3) 93
  Holmes........................21 (III, 3) 93
  Milton........................20 (III, 2) 93
English Language
  Shakespeare..............19–21 (III, 1–3) 93
  Spenser........................17 (II, 2) 93
  Stevenson....................22 (IV, 1) 93
  Trench........................14 (II, 1) 92
English Literature
  16th and 17th century, 41–2 (III, IV, 1–2) 94
  18th Century..............43 (III, IV, 3) 94
  Romantic Poets..........44 (III, IV, 1) 94
  Later 19th Century poets 45-6 (III, IV, 2-3) 94
Ethics....................................281 (IV, 1) 109
Eugenics....................................556 (IV, 3) 125
European History..............................312–4 (I, 1–3) 110
Forging....................................1001 (II, 1–3) 141
Foundry....................................1001 (II, 1–3) 141
French....................................111–2 (I, 2–3) 98
  113–5 (I, 1–3) 98
  116–8 (II, 1–3) 98
  119–21 (III, 1–3) 98
  122–4 (IV, 1–3) 98
  125–7 (II, 1–3) 98
  128–30 (III, 1–3) 99
  131–3 (IV, 1–3) 99
  134 (IV, 3) 99
  135–6 (IV, 2–3) 99
Gas Engines..................................1041 (III 2) 144
General Testing Laboratory..................625–6 (III, 1–2) 129
Geology
  Dynamical..............................491 (III, 1) 120
  Economic..............................521 (IV, 2) 121
  Field..............................494 (IV, 1) 120
    496 (IV, 3) 120
    522 (IV, 3) 121
  General..........................516–17 (IV, 1–2) 121
  Historical..............................492 (III, 2) 120
  Mining..........................523–4 (IV, 1–2) 122

Geometry		406–7 (I, 1)	113
German		71 (I, 2)	95
		72 (I, 3)	95
		75 (I, 1)	96
		80–1 (II, 3; III, 1)	96
		82–3 (III, 2–3)	96
		84–6 (I, 1–3)	96
		87–9 (II, 1–3)	96
		102–4 (IV, 1–3)	97
German Literature		90–2 (III, 1–3)	97
		93–5 (IV, 1–3)	97
		96–8 (IV, 1–3)	97
		99–101 (IV, 1–3)	97
Graphic Statics		698 (IV, 1)	133
Greek	Aeschines	167 (III and IV, 1)	103
	Aeschylus	169, 180 (III and IV, 3)	103–105
	Aristophanes	166, 170, 180 (III, 1, IV, 1, 3, 3)	103–105
	Attic Orators	165, 178 (II, 2, IV, 1)	103–105
	Demosthenes	167 (III and IV, 1)	103
	Drama	166 (II, 3)	103
	Herodotus	162, 175 (III, 1 and I, 2)	102–104
	Homer	163–4, 174–5 (I, 3; II, 1–3; III, 1)	103–104
Greek	Lyric Poets	172 (III and IV, 3)	104
	Lysias	161 (I, 1)	102
	Menander	170 (III and IV, 1)	103
	Plato	161, 177 (I, 1; III, 3)	102–105
	Sophocles	166, 168, 179 (II, 3; III and IV, 2)	103–105
	Theocritus	172 (III and IV, 3)	104
	Thucydides	171, 176 (III and IV, 2)	104
	Xenophon	161, 173, 174, 177 (I, 1–3) (II, 1–3; III, 3)	102–104–105
Heating and Ventilation		1051 (IV, 3)	144
Hebrew		201–2 (IV, 2–3)	106
History of Education		301 (III, IV, 1–2)	109
History of Philosophy		291 (IV, 2–3)	109
Hydraulics		661–2 (III, 3; IV, 1)	131
		663–4 (III, 3; IV, 1)	131
Hydro-Electric Engineering		872 (IV, 3)	138

Hygiene . . . 580 (I, 1) 126
Illuminating Engineering . . . 852 (III, 3) 138
Industrial Management . . . 1061 (IV, 1) 144
International Law . . . 365 (IV, 1) 112
Italian . . . 151–3 (III, 1–3) 100
154–6 (IV, 1–3) 100
Latin
  Cicero . . . 184 (II, 1) 106
  186 (II, 3) 106
  Horace . . . 182–3 (I, 2–3) 106
  Hymns . . . 185 (II, 2) 106
  Juvenal . . . 188 (III, 2) 106
  Letters . . . 191 (IV, 2) 106
  Livy . . . 181 (I, 1) 106
  Lucretius . . . 190 (IV, 1) 106
  Tacitus . . . 187 (III, 1) 106
  189 (III, 3) 106
  Tusculan Disputations . . . 192 (IV, 3) 106
Lead Burning . . . 974 (IV, 2) 141
Least Squares . . . 436 (II, 3) 115
Lettering . . . 442 (I, 1) 116
Logic . . . 251 (III, 3) 109
Machine Design . . . 1012 (IV, 1–3) 143
Machine Drawing . . . 452 (II, 3) 117
Machine Shop . . . 1001 (II, III, 1–3) 141
Masonry . . . 641–2 (III, 3; IV, 1) 129
Mechanics, Applied . . . 621–2 (II, 3; III, 1) 128
Mechanics of Materials . . . 623–4 (III, 1–2) 128
Mechanism . . . 1011 (II, 1–3) 142
Mensuration . . . 421 (I, 3) 114
Metallurgy . . . 951–2 (III, 1–2) 141
953–4 (IV, 1–2) 141
Mine Administration . . . 761 (IV, 3) 135
Mine Construction . . . 746–48 (IV, 1–3) 134
Mine Machinery . . . 756 (IV, 2) 135
Mine Surveying . . . 701 (III, 2) 133
Mineralogy . . . 513 (III, 3) 121
706 (III, 2) 133
Mining . . . 711 (III, 3) 133

Mining	716 (III, 3)	133
	721 (IV, 1)	133
	726 (IV, 1)	134
	731 (IV, 2)	134
	736 (IV, 2)	134
	741 (III, IV, 3)	134
Mining Law	766 (III, IV, 3)	135
Motor Engineering	851 (III, 2)	138
Mining Theses	771 (IV, 3)	135
Ore Dressing	751 (III, IV, 3)	135
Orthographic Projection	443 (I, 2–3)	116
Park Engineering	683 (IV, 2)	131
Pattern Shop	1001 (II, 1–3)	141
Petrography	512 (III, 2)	120
Philosophy	254 (IV, 1)	109
Physical Culture	581 (I, 1–3)	126
Physics	461–3 (II, 3; III, 1–2)	118
	472–7 (II, 1–3)	119
Physiology	555 (IV, 2)	125
Political Science	351–3 (IV, 1–3)	112
Psychology	252 (III, 2–3)	109
	303 (III, IV, 3)	109
Qualitative Analysis	902–4 (III, IV, 1–3)	139
	913–15 (I, 3; II, 1–2)	139
	926–9 (I, 2–3; II, 1–2)	140
Quantitative Analysis	905–7 (IV, 1–3)	139
	916 (II, 3)	139
	918 (III, 1)	140
	930–2 (II, 3; III, 2–3)	140
	933 (IV, 1)	140
Railroads	611–12 (II, 2–3)	128
	614–5 (III, 1–2)	128
Roads and Pavements	631–2 (III, 2)	129
Roof Design	694 (IV, 1)	132
Roofs and Bridges	690–3 (III, 3; IV, 1–3)	132
Sewerage	671–2 (IV, 1–2)	131
Spanish	141–3 (III, 1–3)	100
	144–6 (IV, 1–3)	100

Steam Engineering . . . . 1023 (III, 2) 143
Steam Engines . . . . 1025 (III, 3) 143
Summer School . . . . 602 (I, 3) 127
613 (II, 3) 128
Surveying . . . . 601 (I, 3) 127
603–4 (II, 1; IV, 1) 127
Technical German . . . . 961–6 (III, 1–3; IV, 1–3) 141
Telephone . . . . 881 (IV, 3) 138
Theism . . . . 302 (IV, 2) 109
Theory of Functions . . . . 433–4 (IV, 2–3) 115
Thermodynamics . . . . 1024 (IV, 1–2) 143
Trigonometry . . . . 411–13 (I, 1–3; II, 1) 113
Turbines . . . . 1022 (IV, 2–3) 143
Water Supply . . . . 681–2 (IV, 2–3) 131
Zoology . . . . 552 (III, 2) 124

CLASSICAL COURSE.

The Classical Course leads to the degree of Bachelor of Arts. In order to meet the conditions of contemporary life in which so many schools do not prepare students in Greek for admission to the Classical Course, an arrangement has been made whereby students may enter the Latin Scientific Course and begin Greek in their Freshman Year. Those students who continue to pursue the prescribed course in Greek for four years will receive the Bachelor of Arts degree.

This course affords the best preparation for the professions of law, medicine, and theology. The intellectual training and the specific matters of instruction are particularly adapted to the needs of those who follow these professions. It is sometimes doubted whether it is so well adapted to the preparation for the study of medicine as some of the other courses, but the technical vocabulary of medicine is so largely drawn from the Greek, and the history of the medical profession is so closely associated with the development of science in and through the Classical languages as to make it eminently desirable that the cultivated physician should have a classical education. The course includes all the instruction in Physics, Chemistry and Biology which is required for the admission to the best medical schools. It is so well understood that a classical training is highly desirable for the lawyer and the minister that no reference need be made to these professions except to point out that this course offers the broadest and most liberal culture and that there is a marked reaction in the educational world toward its approved methods. The same is true of the education of the teacher and the journalist. Indeed, it is the broadest in its outlook and the most far-reaching in its foundations. The addition of a wide range of elective studies has made it a desirable preparation for the study of any profession, whether literary or scientific.

The instruction embraces a systematic study of the Bible and the Evidences of Christianity throughout the course, of the Ancient and Modern Languages and their literatures, together with Comparative Philology; Pure and Applied Mathematics; Physics, Chemistry, and the Natural Sciences; Rhetoric and Elocution; Logic and Metaphysics; History and Political Science; and Mental and Moral Philosophy.

SYNOPSIS OF STUDIES.

CLASSICAL COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA 2 AND SOLID GEOMETRY 2†	4	402 & 406
OR		
SOLID GEOMETRY‡	4	407
GREEK	4	161
LATIN	4	181
ENGLISH	2	1
HYGIENE	1	580
THE BIBLE	1	221

Second Term.

	Periods per week.	Course number.*
ALGEBRA†	4	403
OR		
ALGEBRA‡	4	404

* See pages 91–144.

† Entered with Mathematics B, Division A.

‡ Entered with Mathematics A, Division B.

	Periods per week.	Course number.*
GREEK	4	162
LATIN	4	182
ENGLISH	2	2
ELOCUTION	1	51
THE BIBLE	1	222
Third Term.		
TRIGONOMETRY†	4	412
OR		
ALGEBRA‡	4	405
GREEK	4	163
LATIN	4	183
ENGLISH	2	3
ELOCUTION	1	52
THE BIBLE	1	223
SOPHOMORE YEAR.		
First Term.		
ANALYTICAL GEOMETRY†	4	418
OR		
TRIGONOMETRY‡	4	413
GREEK	4	164
LATIN	4	184
ENGLISH	2	14
FRENCH	2	125
ELOCUTION	1	53
THE BIBLE	1	227
THEME	1	62
Second Term.		
PLANE AND SOLID ANALYTICAL GEOMETRY†	4	419
OR		
PLANE ANALYTICAL GEOMETRY‡	4	420
GREEK	4	165
LATIN	4	185
ENGLISH	2	10

---

* See pages 91–144.

† Entered with Mathematics B, Division A.

‡ Entered with Mathematics A, Division B.

	Periods per week.	Course number.*
FRENCH	2	126
ELOCUTION	1	54
THE BIBLE	1	228
THEME	1	62

Third Term.

PHYSICS	4	461
GREEK	4	166
LATIN	2	186
FRENCH	2	127
GERMAN	3	80
CHEMISTRY	2	901
ELOCUTION	1	55
THE BIBLE	1	229
THEME	1	62

JUNIOR YEAR.

First Term.

PHYSICS	4	462
GERMAN	3	81
ELOCUTION	1	56
THE BIBLE	1	236
THEME	1	62

ELECTIVES.

MATHEMATICS	4	429
GREEK	4	167
GEOLOGY	2	491
ENGLISH A	4	19
CHEMISTRY	2	902
BIOLOGY	2	551
FRENCH	2	128
HISTORY	2	331
LATIN	2	187
BIOLOGY	2	571
ENGLISH B	4	41

* See pages 91–144.

	Periods per week.	Course number.*
HISTORY OF EDUCATION	2	301
SPANISH	2	141
ITALIAN	2	151
Second Term.		
PHYSICS	4	463
PHILOSOPHY	3	252
ELOCUTION	1	57
THE BIBLE	1	237
THEME	1	62
ELECTIVES.		
ENGLISH A	4	20
MATHEMATICS	4	430
GEOLOGY	2	492
GREEK	4	168
GERMAN	2	82
HISTORY	2	324
CHEMISTRY	2	903
HISTORY	2	332
FRENCH	2	129
LATIN	2	188
BIOLOGY	4	552
ENGLISH B	4	42
SPANISH	2	142
ITALIAN	2	152
HISTORY OF EDUCATION	2	301
Third Term.		
HISTORY	2	341
LOGIC	2	251
PHILOSOPHY	3	252
ELOCUTION	1	58
THE BIBLE	1	238
THEME	1	62
ELECTIVES.		
ENGLISH A	4	21
MATHEMATICS	4	431

---

* See pages 91–144.

	Periods per week.	Course number.*
GEOLOGY	2	493
GREEK	4	169
GERMAN	2	83
PHYSICS	2 or 4	464–5
CHEMISTRY	2	904
BIOLOGY	4	553
FRENCH	2	130
LATIN	2	189
ENGLISH B	4	43
SPANISH	2	143
ITALIAN	2	153
EDUCATIONAL PSYCHOLOGY	2	303

SENIOR YEAR.

First Term.

ASTRONOMY	4	536
PHILOSOPHY	3	281
ELOCUTION	1	59
BIBLE	1	244
THEME	1	62

ELECTIVES.

ENGLISH A	4	22
POLITICAL SCIENCE	2	351
PHILOSOPHY	2	254–301
PHYSICS	2 or 4	466–7
CHEMISTRY	2	902, 905 or 908
INTERNATIONAL LAW	2	365
MATHEMATICS	2	432
GERMAN	2	90 or 93
BIOLOGY	4	554
ENGLISH B	4	44
GREEK	4	170
FRENCH	2	131
GEOLOGY	2	494
LATIN	2	190

* See pages 91–144.

	Periods per week.	Course number.*
ANGLO-SAXON (optional)	1	11
SPANISH	2	144
ITALIAN	2	154
Second Term.		
PHILOSOPHY	2	302
ECONOMICS	2	371
ELOCUTION	1	60
BIBLE	1	242–243
THEME	1	62
ELECTIVES.		
HISTORY	2	345
MATHEMATICS	2	433
GERMAN	2	91 or 94
GEOLOGY	2	495
ENGLISH A	4	23
BIOLOGY	4	555
GREEK	4	171
FRENCH	2	132 or 135
LATIN	2	191
HEBREW	2	201
PHILOSOPHY	2	291, 301
ENGLISH B	4	45
BLACKSTONE	2	361
BUSINESS LAW	2	363
PHYSICS	2 or 4	468–9
CHEMISTRY	2	903, 906 or 909
ASTRONOMY	2	541
POLITICAL SCIENCE AND COMPARATIVE GOVERNMENT	2	352
ANGLO-SAXON (optional)	1	12
SPANISH	2	145
ITALIAN	2	155
Third Term.		
ECONOMICS	2	372
PHILOLOGY	3	30

---

* See pages 91–144.

	Periods per week.	Course number.*
ELOCUTION	1	61
BIBLE	1	242–243
THEME	1	62
ELECTIVES.		
HISTORY	2	346
MATHEMATICS	2	434
GERMAN	2	92 or 95
GEOLOGY	2	496
ENGLISH A	4	24
BIOLOGY	4	556
GREEK	4	172
FRENCH	2	133 or 136
LATIN	2	192
HEBREW	2	202
ENGLISH B	4	46
BLACKSTONE	2	362
BUSINESS LAW	2	364
PHYSICS	2 or 4	470–1
CHEMISTRY	2	904, 907 or 910
ASTRONOMY	2	542
POLITICAL SCIENCE AND COMPARATIVE GOVERNMENT	2	353
PHILOSOPHY	2	291, 303
ANGLO-SAXON (optional)	1	13
SPANISH	2	146
ITALIAN	2	156

* See pages 91–144.

PARDEE SCIENTIFIC DEPARTMENT.

This Department was organized in 1866, in accordance with the conditions of a gift from Ario Pardee, Esq., of Hazleton, Pa. The original organization has been, from time to time, greatly enlarged and extended largely through the continued munificence of the founder. There are at present two general courses of study, Latin Scientific and General Scientific, and four technical courses.

LATIN SCIENTIFIC COURSE.

This course, which leads to the Degree of Bachelor of Philosophy, was designed to meet the wishes of those who desire to pursue a course of liberal study without Greek. It is the same as the Classical Course except that the time devoted to the study of Greek in that course is given to the study of modern languages; great importance is paid to the study of the English language under the special direction of Professor Francis A. March, Jr.

By a new arrangement, those students in the Latin Scientific Course who desire to do so may begin Greek in the Freshman year, substituting it in Freshman and Sophomore years for modern languages. Those who pursue the study of Greek under this arrangement for four years may qualify for the Bachelor of Arts degree.

SYNOPSIS OF STUDIES.

Latin Scientific Course.

The course of study is the same as the Classical Course except as follows:

FRESHMAN YEAR.

German 84–85–86 is substituted for Greek, four periods a week being given to this subject during the three terms.

SOPHOMORE YEAR.

The Bible is read in Latin 230–31–32 instead of Greek. English 16–17–18 and German 87–88–89 are substituted for Greek.

JUNIOR YEAR.

The Bible is read in Latin 239–40–41 instead of Greek. English History 331 is substituted for German 81. German 91–92 are substituted for 81–3.

(For schedule of studies of the Classical Course see pages 39–45.)

GENERAL SCIENTIFIC COURSE.

This course was originally arranged to meet the demand for a course substituting the modern languages for Latin and Greek, and offering greater opportunities for the study of the sciences than was formerly given in the Classical Course. The extension of the elective system has greatly modified the character of this course. It now is rather designed to meet the requirements of students who, in their preparatory course, have failed to take advantage of opportunities for the study of the classics, and who are seeking a general preparation for business careers or for other callings which do not seem to require an acquaintance with the classical languages and literatures. In order to meet the very different inclinations of students and to make a close articulation with a large number of preparatory schools, a greater latitude is allowed in the preparation for this course than for the other courses, and more consideration is given to individual choice in its earlier years.

Those students who offer advanced mathematics for admission are expected to pursue advanced courses in mathematics and drawing with the students of engineering courses. Those who enter with the same requirement in mathematics as the students of the Latin Scientific Course will pursue the mathematics of that course. Those who offer advanced mathematics will also be expected to pursue the course in chemistry of the engineering courses and to take options connected with the mathematical group throughout the Freshman year. Those who do not offer advanced mathematics will be permitted to choose at the outset of their course between a more distinctly mathematical and scientific course and one offering more extensive courses in modern languages and history. The choice once made will be binding throughout the first two years.

The degree awarded at the completion of this course is Bachelor of Science.

Frequent request is made by students entering this course to be allowed so to modify its requirements as to anticipate some of the courses, particularly those in physics and biology, and thus provide a two years' course on a special schedule. The ground for this request is generally the purpose to prepare for admission to a school of medicine. The arrangement of this course, and more particularly of the Latin Scientific Course, with the opportunities for the election of extensive courses in Biology, Chemistry, Physics, and German has been made after consultation with leading teachers of medicine, and with the view of preparing students for the best medical schools. The order in which the sciences are studied has been carefully considered. The degree of mental development has determined the period in which each study is taken up. The importance of the mental discipline and the equipment of the student for his future work has been met in the requirements in Mathematics, English, and Psychology. In all of these respects this course, like all the courses offered by the College, aims rather at thoroughness than quickness of preparation. It is intended to impress upon the student that success in any profession or calling can be attained only by thoroughgoing and liberal training.

SYNOPSIS OF STUDIES.

GENERAL SCIENTIFIC COURSE.

FRESHMAN YEAR.

First Term.

		Periods per week.	Course number.*
1.	ALGEBRA	2	401
	TRIGONOMETRY	2	411
	ENGLISH	2	1
	CHEMISTRY	4	911
	DRAWING AND LETTERING	2	441*a*, 442
	GERMAN	4	75
	OR		
	FRENCH	4	113
	HYGIENE	1	580
	THE BIBLE	1	221
2.	ALGEBRA AND SOLID GEOMETRY	4	402 & 406 or 407
	ENGLISH	2	1
	GERMAN	4	75
	OR		
	FRENCH	4	113
	HISTORY	2	312
	CHEMISTRY	4	911

---

* See pages 91–144.

		Periods per week.	Course number.*
	Hygiene	1	580
	The Bible	1	221

Second Term.

		Periods per week.	Course number.*
1.	Algebra	3	401
	Trigonometry	2	411
	English	2	2
	Chemistry	2	926
	German	4	71
	or		
	French	4	114
	Drawing and Projection	2	441*b*, 443*a*
	The Bible	1	222
2.	Algebra	4	403
	English	2	2
	Chemistry	2	926
	German	4	71
	or		
	French	4	114
	History	2	313
	The Bible	1	222

Third Term.

		Periods per week.	Course number.*
1.	Analytical Geometry and Mensuration	5	416 & 421
	English	2	3
	Chemistry	2	927
	German	4	72
	or		
	French	4	115
	Drawing and Projection	2	441*c*, 443*b*
	The Bible	1	223
2.	Trigonometry or Algebra	4	412 or 404
	English	2	3
	Chemistry	2	927
	German	4	72
	or		
	French	4	115

---

* See pages 91–144.

	Periods per week.	Course number.*
HISTORY	2	314
THE BIBLE	1	223

SOPHOMORE YEAR.

First Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY 2 AND DIFFERENTIAL CALCULUS 3†	5	417 & 426
OR TRIGONOMETRY OR		413
ANALYTICAL GEOMETRY‡	4	418
ENGLISH	2	14
GERMAN	2	87
FRENCH**	2	125
FRENCH***	2	116
ENGLISH	2	16
CHEMISTRY.—Analytical Chemistry	2	928
HISTORY	2	321
THE BIBLE	1	224
ELOCUTION	1	53
THEME	1	62

Second Term.

	Periods per week.	Course number.*
CALCULUS†	5	427
OR		
ANALYTICAL GEOMETRY‡	4	419
ENGLISH	2	17
CHEMISTRY	2	929
HISTORY	2	322
ANGLO-SAXON	2	10
THE BIBLE	1	225
GERMAN	2	88
FRENCH**	2	126

* See pages 91–144.

† Entered with Mathematics B.

‡ Entered with Mathematics A.

** Entered with German.

*** Entered with French.

	Periods per week.	Course number.*
FRENCH***	2	117
ELOCUTION	1	54
THEME	1	62

Third Term.

	Periods per week.	Course number.*
PHYSICS	4	461
ENGLISH	4	18
BIOLOGY	4	561
CHEMISTRY	2	930
HISTORY	2	323
THE BIBLE	1	226
GERMAN	2	89
FRENCH**	2	127
FRENCH***	2	118
ELOCUTION	1	55
THEME	1	62

JUNIOR YEAR.

First Term.

	Periods per week.	Course number.*
PHYSICS	4	462
HISTORY	2	331
THE BIBLE	1	233
ELOCUTION	1	56
THEME	1	62

ELECTIVES.

	Periods per week.	Course number.*
GEOLOGY	2	491
ENGLISH A	4	19
ENGLISH	2	41
CHEMISTRY	2	902
BIOLOGY	2	551
BIOLOGY	2	571
FRENCH	2	128
GERMAN	2	90–93–96

---

* See pages 91–144.

** Entered with German.

***Entered with French.

	Periods per week.	Course number.*
ITALIAN	2	151
SPANISH	2	141
HISTORY OF EDUCATION	2	301

After the First Term, Junior year, the schedule of study for the General Scientific Course is the same as for the Classical Course, except that during the rest of the Junior year the Bible is taken with the Technical students; and German 91–2, 94–5 or 97–8 is substituted for 82–3. (For schedule of study of the Classical Course see pages 39–45.)

* See pages 91–144.

THE CIVIL ENGINEERING COURSE.

The course in Civil Engineering has been designed to develop the mental faculties of the student in those studies which form the foundation of all branches of Technology with additional training in the subjects classed as Civil Engineering. The course also includes such general subjects, essential to a liberal education, as are shown in the synopsis on pages 58–62.

The graduate is prepared for immediate usefulness in the field and office, and, after a moderate amount of professional experience, to fill positions of trust and importance, not only in his chosen profession, but in allied work in mining, mechanical, electrical and architectural engineering.

CIVIL ENGINEERING LABORATORIES AND EQUIPMENT.

The Department has a large equipment of instruments necessary for various branches of engineering field practice, including tapes, compasses, transits, levels, plane tables, barometers, standard base line tapes and pulling apparatus, sextants, solar attachments, chronometers, floats and current meters. A twelve-inch portable altazimuth instrument, reading to single seconds by micrometer microscopes, and provided with level for double zenith distances, is used for instruction in Geodesy and Practical Field Astronomy. A precision level of the latest design is employed in instruction in precise leveling. The astronomical observatory contains an equatorial

PARDEE HALL.

telescope, transit, clock, chronograph, meteorological instruments, etc.

For use in the lecture room there are numerous models of the various types of bridge and roof trusses; several complete sets of full-weight standard rolled sections; numerous full-weight sections of riveted joints, representing bridge and boiler work, hand and power riveting; wall charts; working drawings; photographs; slide rules; and lantern, with reflectoscope. The hydraulic lecture room is directly connected with the laboratory, so that its equipment may be used for demonstration purposes before the class.

The Department also has a full-weight pin-connected highway bridge of fifty-feet span and fourteen-feet roadway weighing twelve tons, together with all false work and tools necessary to erect the same.

The GENERAL TESTING LABORATORY contains one transverse machine of 400,000 pounds' capacity for specimens up to twenty-five feet in length and four feet in width, one 200,000-pound, three 100,000-pound screw testing machines and one 60,000-pound hydraulic testing machine arranged for tension, compression and transverse testing; a 4,000-pound wire tester and a small machine for testing cord, twine, etc.; a 4,000-pound transverse machine for specimens up to sixteen feet, and a smaller transverse machine for specimens up to five feet, arranged with micrometers for measuring deflections; and extension meters for measuring fiber deformations. The laboratory also contains a torsion machine of 125,000 inch-pounds capacity for specimens up to twenty feet in length and a 10,000 inch-pound torsion machine of the pendulum type for short specimens;

a number of elongation meters of different types, compressometers and smaller micrometers, hand tools, etc., and apparatus for calibrating machines. There are also a number of special apparatus for shearing, punching, bending, etc., tests.

The CEMENT LABORATORY is fully equipped for conducting routine tests of cement according to the latest specifications together with apparatus for research work. The laboratory contains three 1000-pound machines for tension tests and one 2000-pound machine for compression and tension tests. There is also a machine for moulding briquettes under pressure and a power-driven Boehme hammer, ball mill and an automatic sieving apparatus. Each student is provided with a slate top mixing table and with cement and sand boxes, moist closet and necessary hand tools. The laboratory is further equipped with large immersion tanks with running water, cement bins, briquette racks, moist closets, and all necessary apparatus to enable a number of students to work on the same routine tests during the same laboratory period.

The CONCRETE LABORATORY has a large mixing floor; storage bins for stone, sand and cement; a concrete immersion tank to accommodate beams fifteen feet in length; a beam crane and trucks of two tons' capacity; beam, compression and tension moulds; sieves, scales, mixing pans, measures, shovels, etc.

The ROAD MATERIAL LABORATORY contains equipment for performing the abrasion and absorption tests on paving brick (the transverse test of paving brick being performed in the GENERAL TESTING LABORATORY), and equipment for the durability test of road metal. This equipment consists of a brick rattler and a Deval abrasion machine, a drying oven, scales, immersion tanks, sieves, etc.

The HYDRAULIC LABORATORY contains a vertical pressure tank eighteen feet in height and five feet in diameter, arranged for making experiments on the flow of water through orifices and nozzles under heads up to three hundred feet, and provided with a device by which the orifice plates can be removed while the tank is under pressure; other smaller tanks for use under low heads; a standpipe sixty feet high; two tanks, thirty feet long for weir experiments and measurements of quantity; a turbine; impulse wheels; a centrifugal pump run by electric motor and provided with electric measuring instruments; rotary, disc and reciprocating water meters; a Venturimeter; a weighing tank; absolute and differential pressure gauges; and other appliances for the measuring of water used in experiments and for the testing of meters, motors, nozzles and fire hydrants; as well as arrangements for lecture-room illustrations. There is also connected with the laboratory a one-million gallon Worthington duplex pump.

The SHOP contains two lathes, a drill press, a planer, a milling machine, a grinder and other necessary appliances for preparation of test specimens, models and apparatus; and for repair work.

The COLLEGE LIBRARY is well equipped with engineering books and periodicals.

SYNOPSIS OF STUDIES.

CIVIL ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA	2	401
TRIGONOMETRY	2	411
CHEMISTRY	4	911
GERMAN†	4	75
OR		
FRENCH‡	4	113
ENGLISH	2	1
DRAWING AND LETTERING	2	441*a*–442
THE BIBLE	1	221
HYGIENE AND PHYSICAL CULTURE	1	580

Second Term.

	Periods per week.	Course number.*
ALGEBRA	3	401
TRIGONOMETRY	2	411
CHEMISTRY	2	926
FRENCH†	4	111
FRENCH‡	4	114
ENGLISH	2	2
DRAWING AND PROJECTION	2	441*b*–443*a*
THE BIBLE	1	222

Third Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY	4	416
MENSURATION	1	421
CHEMISTRY	2	927
FRENCH†	4	112
GERMAN‡	4	71
ENGLISH	2	3
DRAWING AND PROJECTION	2	441*c*–443*b*

* See pages 91–144.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
SURVEYING	2	601
THE BIBLE	1	223
THEME	1	63
SUMMER SCHOOL IN SURVEYING (in vacation) THREE WEEKS		602

SOPHOMORE YEAR.

First Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS	3	426
PHYSICS	4	472
DESCRIPTIVE GEOMETRY	2 1/3	451*a*
SURVEYING	2	603
SHOP WORK	2	1001
THE BIBLE	1	224
THEME	1	62

Second Term.

	Periods per week.	Course number.*
DIFFERENTIAL AND INTEGRAL CALCULUS	5	427
PHYSICS	4	473
DESCRIPTIVE GEOMETRY	2 1/3	451*b*
RAILROADS	2	611
SHOP WORK	2	1001
THE BIBLE	1	225
THEME	1	62

Third Term.

	Periods per week.	Course number.*
PHYSICS	4	474
DESCRIPTIVE GEOMETRY	2 1/3	451*c*
MACHINE DRAWING	1 1/3	452
APPLIED MECHANICS	4	621
RAILROADS	2	612
SHOP WORK	2	1001
THE BIBLE	1	226
SUMMER SCHOOL IN SURVEYING (in vacation) THREE WEEKS		613
THEME	1	62, 63

---

* See pages 91–144.

JUNIOR YEAR.

First Term.

	Periods per week.	Course number.*
METALLURGY	2	951
CRYSTALLOGRAPHY	2	511
APPLIED MECHANICS	4	622
RAILROADS	3	614
MECHANICS OF MATERIALS	4	623
GENERAL TESTING LABORATORY	2	625
CEMENT	2	651
CEMENT LABORATORY	2	654
ELEMENTS OF ELECTRICAL ENGINEERING	3	804
SPANISH (optional)	2	141
ITALIAN (optional)	2	151
THE BIBLE	1	233
THEME	1	62
Second Term.		
STEAM ENGINEERING	3	1023
PETROGRAPHY	2	512
SPANISH (optional)	2	142
ITALIAN (optional)	2	152
MECHANICS OF MATERIALS	4	624
GENERAL TESTING LABORATORY	2	626
ELECTRICAL LABORATORY	2	827
CONCRETE, PLAIN	2	652
CONCRETE (PLAIN) LABORATORY	2	655
RAILROADS	2	615
ROADS AND PAVEMENTS	2	631
ROAD MATERIAL LABORATORY	1	632
THE BIBLE	1	234
THEME	1	62
Third Term.		
MINERALOGY (systematic)	3	513
SANITARY BIOLOGY	2	561
ASTRONOMY	2	543
SPANISH (optional)	2	143

* See pages 91–144.

	Periods per week.	Course number.*
ITALIAN (optional)	2	153
CONCRETE, REINFORCED	2	653
CONCRETE (REINFORCED) LABORATORY	2	656
MASONRY	2	641
HYDRAULICS	3	661
HYDRAULIC LABORATORY	1	663
FRAMED STRUCTURES	2	690
ELECTRICAL LABORATORY	2	828
BIBLE	1	235
THEME	1	62

SENIOR YEAR.

First Term.

ENGLISH	2	4
GENERAL GEOLOGY	2	516
ROOFS AND BRIDGES	2	691
ROOF DESIGN	1	694
GRAPHIC STATICS	1	698
HYDRAULICS	3	662
HYDRAULIC FIELD WORK	–	664
MASONRY DESIGN	2	642
SEWERAGE	2	671
HIGHER SURVEYING	2	604
SPANISH (optional)	2	144
ITALIAN (optional)	2	154
BIBLE	1	244
THEME	1	62

Second Term.

ECONOMICS	2	371
ENGLISH	2	5
GENERAL GEOLOGY	2	517
ROOFS AND BRIDGES	6	692
BRIDGE DESIGN	2	695
SEWERAGE DESIGN	2	672
WATER SUPPLY	3	681
PARK ENGINEERING	1	683

* See pages 91–144.

	Periods per week.	Course number.*
SPANISH (optional)	2	145
ITALIAN (optional)	2	155
BIBLE	1	242–243
THEME	1	62
Third Term.		
ENGLISH	2	6
ROOFS AND BRIDGES	5	693
BRIDGE DESIGN	5	696
BRIDGE ERECTION	(2 days)	697
WATER SUPPLY DESIGN	2	682
SPANISH (optional)	2	146
ITALIAN (optional)	2	156
THESIS	2	699
BIBLE	1	242–243

* See pages 91–144.

THE MINING ENGINEERING COURSE.

The course leading to the degree of Engineer of Mines (E.M.) is intended to give a general education and to prepare men for positions of responsibility in mining, metallurgy and general engineering. The policy of the Mining Department is to give thorough training in the underlying principles of mathematics, physics, chemistry, mineralogy, geology, metallurgy, surveying, mining engineering, and some practical knowledge in mechanical, civil and electrical engineering. With this fundamental training the mining graduates can successfully carry on specialized work and be rapidly advanced to positions of responsibility.

The training in geology consists of the study of mineralogy, crystallography, petrography, general and economic geology, and the geology of ore deposits.

The course in chemistry consists of lectures, recitations and laboratory work in organic chemistry, qualitative, quantitative and metallurgical analysis, blowpiping and assaying.

The work in the chemical, physical, mineralogical and geological laboratories and the drafting rooms is of a high standard. Although much time is given to the practical training in the laboratories, yet the work in such laboratories is always subordinated to the fundamental and all important class room work.

The study of Mining proper consists of courses extending throughout the Junior and Senior years and includes: mine surveying and problems, prospecting, deep boring, blasting, quarrying, shaft-sinking, drifting, tunneling, methods of mining and timbering, haulage, winding, ventilation, drainage, mining laws, mine and mill construction, ore dressing, metallurgy, mine machinery and mine administration.

Lafayette College is situated within easy reach of the anthracite coal fields, and magnetic iron mines of Pennsylvania and New Jersey, the zinc and copper mines of New Jersey and extensive quarries of cement rock, slate, serpentine, limestone and sandstone; the Bethlehem Steel Works, and also rolling mills, iron foundries, the Ingersoll-Rand Co., which is one of the largest manufacturers of mine machinery in the world, are located near Easton, and thus the mining students have opportunities of inspecting and studying the practical mining and metallurgical methods.

EQUIPMENT.

The college library contains the important periodicals on mining, metallurgical and engineering, and the transactions of the various engineering societies. A special mining library containing all mining books of value has been created for the convenience of the mining students.

The class room work in mining is illustrated by a large number of lantern slides, wall diagrams, maps of mines, drawings of mine plant and machinery, models of head-frames, shafts, square set timbering, rock drills, hammers, picks, blasting apparatus, wire rope, screens, safety lamps, collection of minerals, anemometers, compasses, clinometers, dipping needles, transits, levels, barometers, and all the necessary instruments and equipment in surveying and mapping.

The milling laboratory is a model concentrating plant that is fully equipped to crush, classify, separate and concentrate ores. The equipment consists of a Blake crusher, Cornish rolls, elevators, centrifugal pump, trommels, hydraulic classifiers, spitzkastens, a Wilfley shaking table, a slime table, New Century jigs, and a motor to supply power.

The mine gas analysis laboratory is well equipped to determine quantitatively the various mine gases by both titration and absorption methods.

The equipments of other departments available to the mining students are described in this catalogue as follows:

Page
GENERAL TESTING LABORATORY.............. 55
HYDRAULIC LABORATORY..................... 57
CHEMISTRY AND ASSAYING................... 86
ELECTRICAL ENGINEERING LABORATORY........ 72
MECHANICAL ENGINEERING LABORATORY....... 78

VACATION COURSES.

All students in the mining course are required to take the three weeks' Summer school of surveying at end of Freshman year.

Two weeks in the Spring vacation of Junior and Senior years are spent in an actual mine survey, and in inspecting and studying the practical mining operations. Students are strongly advised to spend at least one Summer vacation during their course in actual work at the mines.

SYNOPSIS OF STUDIES.

MINING ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA	2	401
TRIGONOMETRY	2	411
CHEMISTRY	4	911
GERMAN†	4	75
OR		
FRENCH‡	4	113
ENGLISH	2	1
DRAWING AND LETTERING	2	441*a*–442
THE BIBLE	1	221
HYGIENE	1	580

Second Term.

	Periods per week.	Course number.*
ALGEBRA	3	401
TRIGONOMETRY	2	411
CHEMISTRY	2	926
FRENCH†	4	111
FRENCH‡	4	114
ENGLISH	2	2
DRAWING AND PROJECTION	2	441*b*–443*a*
THE BIBLE	1	222

Third Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY	4	416
MENSURATION	1	421
CHEMISTRY	2	927
FRENCH†	4	112
GERMAN‡	4	71
ENGLISH	2	3
DRAWING AND PROJECTION	2	441*c*, 443*b*
SURVEYING	2	601

---

* See pages 91–144.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
THE BIBLE	1	223
THEME	1	63
SUMMER SCHOOL IN SURVEYING (in vacation) 3 WEEKS	–	602

SOPHOMORE YEAR.

First Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS	3	426
CHEMISTRY	2	928
PHYSICS	4	472
SHOP WORK	2	1001
DESCRIPTIVE GEOMETRY	$2^{1}/_{3}$	451*a*
THE BIBLE	1	224
THEME	1	62

Second Term.

	Periods per week.	Course number.*
DIFFERENTIAL AND INTEGRAL CALCULUS	5	427
CHEMISTRY	2	929
PHYSICS	4	473
SHOP WORK	2	1001
DESCRIPTIVE GEOMETRY	$2^{1}/_{3}$	451*b*
THE BIBLE	1	225
THEME	1	62

Third Term.

	Periods per week.	Course number.*
APPLIED MECHANICS	4	621
CHEMISTRY	2	930
PHYSICS	4	474
DESCRIPTIVE GEOMETRY	$2^{1}/_{3}$	451*c*
MACHINE DRAWING	$1^{1}/_{3}$	452
SHOP WORK	2	1001
THE BIBLE	1	226
THEME	1	62, 63

JUNIOR YEAR.

First Term.

	Periods per week.	Course number.*
APPLIED MECHANICS	4	622

---

* See pages 91–144.

	Periods per week.	Course number.*
MECHANICS OF MATERIALS	4	623
ELEMENTS OF ELECTRICAL ENGINEERING	3	804
METALLURGY	2	951
CRYSTALLOGRAPHY	2	511
BOILERS	3	1021
SPANISH (optional)	2	141
ITALIAN (optional)	2	151
BIBLE	1	233
THEME	1	62

Second Term.

METALLURGY	2	952
MECHANICS AND MATERIALS	4	624
BOILERS	3	1021
ELECTRICAL LABORATORY	2	827
PETROGRAPHY	2	512
MINE SURVEYING	2	701
BIBLE	1	234
THEME	1	62
(Spring vacation mine survey trip.)		
SPANISH (optional)	2	142
ITALIAN (optional)	2	152

Third Term.

MINERALOGY	2	513
HYDRAULICS	3	661
ASTRONOMY	2	543
MINING LAW	2	766
ELECTRICAL LABORATORY	2	828
DEEP BORING	1	711
DRILLING AND BLASTING	1	716
ORE DRESSING	4	751
STEAM ENGINES	3	1025
BIBLE	1	235
THEME	1	62

---

* See pages 91–144.

	Periods per week.	Course number.*
SPANISH (optional)	2	143
ITALIAN (optional)	2	153

SENIOR YEAR.

First Term.

ENGLISH	2	4
GENERAL GEOLOGY	2	516
HYDRAULICS	3	662
MINE CONSTRUCTION	2	746
FIELD GEOLOGY	2	523
SHAFT SINKING AND DRIFTING	2	721
MINE EXPLOITATION	2	726
SPANISH (optional)	2	144
ITALIAN (optional)	2	154
BIBLE	1	244
THEME	1	62

Second Term.

GENERAL GEOLOGY	2	517
GEOLOGY OF ORE DEPOSITS	2	521
ASSAYING	2	955
MINE CONSTRUCTION	2	747
MINE VENTILATION	3	736
MINE MACHINERY	2	756
ECONOMICS	2	371
ENGLISH	2	5
BUSINESS LAW (optional)	2	363
SPANISH (optional)	2	145
ITALIAN (optional)	2	155
BIBLE	1	242–43
THEME	1	62

(Spring vacation mine inspection trip.)

Third Term.

PETROGRAPHY	2	512
GEOLOGY OF ORE DEPOSITS	2	522

---

* See pages 91–144.

	Periods per week.	Course number.*
MINE CONSTRUCTION	2	748
ORE DRESSING	4	751
MINE DRAINAGE	3	741
MINING LAW	2	766
MINE ADMINISTRATION	2	766
MINE HAULING AND HOISTING	3	731
BUSINESS LAW (optional)	2	364
ENGLISH	2	6
SPANISH (optional)	2	146
ITALIAN (optional)	2	156
BIBLE	1	242–43
THESIS	2	771

* See pages 91–144.

THE ELECTRICAL ENGINEERING COURSE.

The object of the course in Electrical Engineering is to give thorough instruction in such branches of engineering, both general and electrical, as shall fit the graduate to successfully meet and solve the problems which come to him as practicing electrical engineer. To this end, stress is laid on the attainment of a broad engineering and scientific training rather than on the specialization along any particular line or lines of Electrical Engineering. The aim is to train neither specialists nor artisans, but to give such instruction as shall enable the engineer to build up from the foundation of his knowledge of basic principles such specialized knowledge or reasoning as may be required to successfully meet the problem arising for solution.

The Freshman and Sophomore years are devoted to general instructional and culture courses. Thorough training is given in Mathematics, and Physics is taken throughout the Sophomore year, additional hours in elementary electricity and magnetism being given to the students from the Department of Electrical Engineering, so that they may be especially prepared to take up successfully their particular line of training during the last two years of their course.

Beginning with the second term of the Sophomore year, the fundamental principles of Electrical Engineering are studied in the class room and worked out in the laboratory, the design room, and in problem work. The aim has been to so arrange these several lines that they shall be mutually supplemental and thus give the student a clear, general conception of the principles involved, their correlation and relative importance.

The plan is continued throughout the Senior year as well, attention now being paid to the direct application of the theories and principles thus arrived at, to the various phases of present-day commercial practice, consideration being given to the financial and commercial as well as the engineering side.

The graduate is in this way prepared to take up in an effective and intelligent manner any branch of electrical engineering requiring general or special electrical training.

ELECTRICAL ENGINEERING LABORATORIES AND EQUIPMENT.

The laboratories are large and well arranged. The main electrical laboratory is thirty by sixty feet in dimensions, and is fitted up with representative types of continuous and alternating current generators and motors, lamp-banks, water rheostats, brakes, etc.; and the necessary instruments are supplied for loading and testing generators and motors.

The laboratories are supplied from the Easton Power Company's station, with two-phase, alternating current, at a frequency of sixty cycles. This current is available for testing purposes.

A fifty kilowatt motor-generator set has been installed for the purpose of supplying the laboratories with direct current. This set consists of a seventy-five horse power induction motor, directly connected to two twenty-five kilowatt, 120-volt direct current dynamos, the current from which is supplied to the laboratories by means of the three-wire system.

In case of need, direct current from the plant of the Easton Power Company is also available.

While designed primarily as a source of direct current, this motor-generator set is so installed as to be available at all times for experimental tests by the students.

A portion of the laboratories is fitted up for the more delicate tests required. This consists of two rooms, each being about twenty-two feet square, containing the necessary instruments for accurate testing, among which are a Leeds and Northup Potentiometer, a Thompson Quadrant Electrometer, D'Arsonval Galvanometers, Wheatstone Bridges, condensers, etc. Particular attention is paid to photometry of electric illuminants and specially fitted rooms have been provided for this work.

SYNOPSIS OF STUDIES.

ELECTRICAL ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course numbers*
ALGEBRA	2	401
TRIGONOMETRY	2	411
CHEMISTRY	4	911
GERMAN†	4	75
or		
FRENCH‡	4	113
ENGLISH	2	1
DRAWING AND LETTERING	2	441*a*–442
THE BIBLE	1	221
HYGIENE	1	580

* See pages 91–144.

† Entered on German.

‡ Entered on French.

Second Term.

	Periods per week.	Course number.*
ALGEBRA	3	401
TRIGONOMETRY	2	411
CHEMISTRY	2	926
FRENCH†	4	111
FRENCH‡	4	114
ENGLISH	2	2
DRAWING AND PROJECTION	2	441*b*, 443*a*
THE BIBLE	1	222

Third Term.

ANALYTICAL GEOMETRY	4	416
MENSURATION	1	421
CHEMISTRY	2	927
FRENCH†	4	112
GERMAN‡	4	71
ENGLISH	2	3
DRAWING AND PROJECTION	2	441*c*, 443*b*
SURVEYING	2	601
THE BIBLE	1	223
THEME	1	63

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS	3	426
SHOP WORK	2	1001
DESCRIPTIVE GEOMETRY	$2^1/_3$	451*a*
PHYSICS	6	472, 475
THE BIBLE	1	224
THEME	1	62

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS	5	427
DESCRIPTIVE GEOMETRY	$2^1/_3$	451*b*

---

* See pages 91–144.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
PHYSICS	4	473
ELEMENTS OF ELECTRICAL ENGINEERING	2	476
SHOP WORK	2	1001
THE BIBLE	1	225
THEME	1	62
Third Term.		
DESCRIPTIVE GEOMETRY	$2^1/_3$	451*c*
MACHINE DRAWING	$1^1/_3$	452
PHYSICS	4	474
ELEMENTS OF ELECTRICAL ENGINEERING	2	477
APPLIED MECHANICS	4	621
SHOP WORK	2	1001
THE BIBLE	1	226
THEME	1	62, 63
JUNIOR YEAR.		
First Term.		
APPLIED MECHANICS	4	622
MECHANICS OF MATERIALS	4	623
ALTERNATING CURRENT ENGINEERING	3	811
ELECTRICAL LABORATORY	2	821
ENGINEERING ABSTRACTS	1	831
SHOP WORK	2	1001
STEAM BOILERS	3	1021
SPANISH (optional)	2	141
ITALIAN (optional)	2	151
THE BIBLE	1	233
THEME	1	62
Second Term.		
MECHANICS OF MATERIALS	4	624
ALTERNATING CURRENT ENGINEERING	3	812
ELECTRICAL LABORATORY	2	822
ENGINEERING ABSTRACTS	1	831
MOTOR ENGINEERING	3	851
SHOP WORK	2	1001
STEAM BOILERS	3	1021

* See pages 91–144.

	Periods per week.	Course number.*
SPANISH	2	142
ITALIAN	2	152
THE BIBLE	1	234
THEME	1	62
Third Term.		
DIFFERENTIAL EQUATIONS	3	437
HYDRAULICS	3	661
ELECTRICAL LABORATORY	2	823
ENGINEERING ABSTRACTS	1	831
ILLUMINATING ENGINEERING	3	852
SHOP WORK	2	1001
STEAM ENGINEERING	3	1023
SPANISH (optional)	2	143
ITALIAN (optional)	2	153
THE BIBLE	1	235
THEME	1	62

SENIOR YEAR.

First Term.

ENGLISH	2	4
HYDRAULICS	3	662
ELECTRICAL POWER TRANSMISSION	4	861
ELECTRICAL LABORATORY	2	824
ENGINEERING ABSTRACTS	1	831
ELECTRICAL DESIGN	2	841
THERMODYNAMICS	4	1024
SPANISH	2	144
ITALIAN	2	154
THE BIBLE	1	244
THEME	1	62
Second Term.		
ENGLISH	2	5
BUSINESS LAW	2	363
ECONOMICS	2	371
ELECTRICAL LABORATORY	2	825

---

* See pages 91–144.

	Periods per week.	Course number.*
ENGINEERING ABSTRACTS	1	831
ELECTRICAL DESIGN	2	842
ELECTRICAL POWER STATIONS	3	871
THERMODYNAMICS	3	1024
SPANISH	2	145
ITALIAN	2	155
THE BIBLE	1	242–43
THEME	1	62

Third Term

ENGLISH	2	6
ELECTRICAL LABORATORY	2	826
ENGINEERING ABSTRACTS	1	831
ELECTRICAL RAILWAY ENGINEERING	5	853
HYDRO-ELECTRIC ENGINEERING	4	872
SPANISH	2	146
ITALIAN	2	156
THESIS WORK	2	891
THE BIBLE	1	242–43
GRADUATION THESIS.		

---

* See pages 91–144.

THE MECHANICAL ENGINEERING COURSE.

The course in Mechanical Engineering aims to equip the student to handle general engineering problems. Courses in class room, drawing room, shops and laboratories, aim to give the student practice in the work that engineers are called on to perform, to enable him to base his work on principles and not on empirical formulae, and to give him the theory and practice necessary to deal intelligently with other men.

The recitation work of the Department begins with the study of Mechanism, and courses in valve gears, mechanisms of modern machine tools, boilers, steam engines, turbines, gas engines, thermo-dynamics, etc., are given in their turn. A course in machine design is given with the object of applying the principles already learned.

The work in the shops is given with the idea of teaching engineering principles and not manual training. Each student is required to keep the actual cost of every job assigned to him, a rate for his time being assumed.

The work in the Engineering Laboratory will be given with the object of drilling the student in the experimental work which the engineer is called on to perform, as boiler, pump, engine tests, etc.

MECHANICAL ENGINEERING LABORATORIES AND EQUIPMENT.

The new Shop and Steam Laboratory is 102 feet wide, 183 feet long, and 40 feet from floor to peak of roof, and is constructed entirely of concrete, steel, brick, and glass, making a light, airy building, absolutely fireproof. Two partitions 8 feet high extend down the center of the large room, forming a passage-way, to the left of which is the pattern and machine shop, and to the right the steam laboratory and instructors' offices. At the back of these are the forge shop, the foundry, and the boiler room, connected with each of which is a storage room for the material to be used, and a coal bunker. A large toilet room, supplied with hot and cold water and fitted with individual lockers, is provided in the basement for the convenience of the students.

The pattern shop is completely equipped with benches, lathes, band saw, circular saw, planer, etc., and all the accessories necessary in an efficient shop.

The foundry is supplied with a cupola, a soft metal furnace, a core oven, ladles, flasks, and all tools necessary to make moulds and turn out practical castings in brass or iron. A large bull-ladle of a capacity equal to that of the cupola is kept under the tap-spout at all times, that in case there should be a break at the breast no molten iron can spatter upon the floor and endanger the men.

The forge shop is equipped with student forges, and a large instructor's forge, all of the down-draft type, anvils, and all of the tools used for the shaping and welding of metals by this process.*

The machine shop is fully equipped with vise benches for hand work, lathes, planers, shapers, milling machines, drill presses, power saw, grinding machine, and all small tools to go with each of the machines. All are motor-driven, and direct-connected wherever possible, making a light shop, eliminating the danger of belts, and also furnishing a convenient means for testing any of the machines, or tools of various makes of steel, under different conditions of operation. The gears are encased to give greater safety to the operator.

---

* In connection with the forge shop there is a sheet metal and pipe shop equipped with the necessary tools to give instruction in sheet metal and pipe work.

The steam laboratory is to be equipped with standard types of steam engines installed to run condensing or non-condensing. Injectors, pumps, steam turbines, gas engines, and all instruments required for complete tests will be furnished. The boiler room will contain a fire tube and a water tube boiler, to furnish steam for the laboratory, and also to provide a convenient plant for instruction in firing, operating, and testing boilers.

All of the equipment is of full practical size of standard make, most modern design, and of a type that offers the greatest educational advantages. Every care has been taken to make all of the equipment as safe as possible for the inexperienced student. Certain machines may be used only under the direct supervision of an instructor.

SYNOPSIS OF STUDIES.

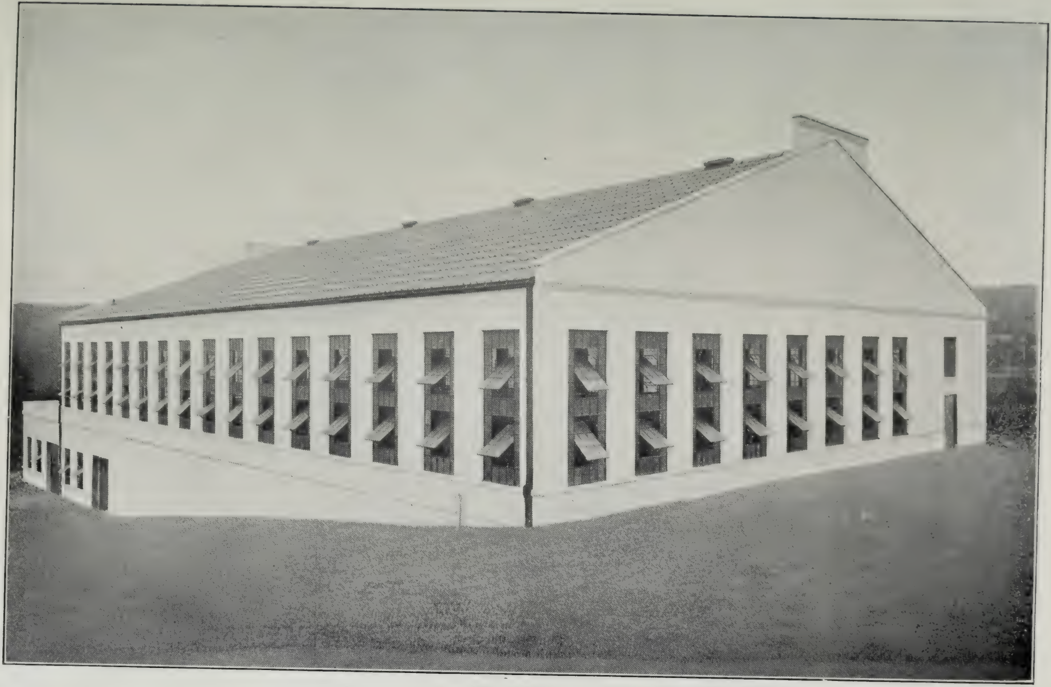
MECHANICAL ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course numbers*
ALGEBRA	2	401
TRIGONOMETRY	2	411
CHEMISTRY	4	911

* See pages 91–144.



MECHANICAL ENGINEERING LABORATORY AND SHOP.

	Periods per week.	Course number.*
GERMAN†	4	75
OR		
FRENCH‡	4	113
ENGLISH	2	1
DRAWING AND PROJECTION	2	441*a*–442
BIBLE	1	221
HYGIENE	1	580

Second Term.

ALGEBRA	3	401
TRIGONOMETRY	2	411
CHEMISTRY	2	926
FRENCH†	4	111
FRENCH‡	4	114
ENGLISH	2	2
DRAWING AND PROJECTION	2	441*b*–443*a*
BIBLE	1	222

Third Term.

ANALYTICAL GEOMETRY	4	416
MENSURATION	1	421
CHEMISTRY	2	927
FRENCH†	4	112
GERMAN‡	4	71
ENGLISH	2	3
DRAWING AND PROJECTION	2	441*c*–443*b*
SURVEYING	2	601
BIBLE	1	223
THEME	1	63

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY	2	417

* See pages 91–144.

† Entered on German.

‡ Entered on French.

	Periods per week.	Course number.*
DIFFERENTIAL AND INTEGRAL CALCULUS	3	426
PHYSICS	4	472
DESCRIPTIVE GEOMETRY	$2^1/_3$	451*a*
MECHANISM	2	1011
SHOP WORK	2	1001
BIBLE	1	224
THEME	1	62

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS	5	427
PHYSICS	4	473
DESCRIPTIVE GEOMETRY	$2^1/_3$	451*b*
MECHANISM	2	1011
SHOP WORK	2	1001
BIBLE	1	225
THEME	1	62

Third Term.

DIFFERENTIAL EQUATIONS	2	437
PHYSICS	4	474
DESCRIPTIVE GEOMETRY	$2^1/_3$	451*c*
MACHINE DRAWING	$1^1/_3$	452
APPLIED MECHANICS	4	621
MECHANISM—VALVE GEARS	2	1011
SHOP WORK	2	1001
BIBLE	1	226
THEME	1	62, 63

JUNIOR YEAR.

First Term.

APPLIED MECHANICS	4	622
MECHANICS OF MATERIALS	4	623
ELEMENTS OF ELECTRICAL ENGINEERING	3	804
BOILERS	3	1021

---

* See pages 91–144.

	Periods per week.	Course number.*
SHOP WORK	2	1001
METALLURGY	2	951
CRYSTALLOGRAPHY	2	511
SPANISH (optional)	2	141
ITALIAN (optional)	2	151
BIBLE	1	233
THEME	1	62

Second Term.

MECHANICS OF MATERIALS	3	624
ELECTRICAL LABORATORY	2	827
BOILERS	3	1021
GAS ENGINES	3	1041
SHOP WORK	2	1001
METALLURGY	2	952
PETROGRAPHY	2	512
SPANISH (optional)	2	142
ITALIAN (optional)	2	152
BIBLE	1	234
THEME	1	62

Third Term.

HYDRAULICS	3	661
FRAMED STRUCTURES	2	690
ELECTRICAL LABORATORY	2	828
STEAM ENGINES	3	1025
SHOP WORK	2	1001
SPANISH (optional)	2	143
ITALIAN (optional)	2	153
BIBLE	1	235
THEME	1	62

SENIOR YEAR.

First Term.

ENGLISH	2	4
GRAPHIC STATICS	1	698
HYDRAULICS	3	662

* See pages 91–144.

	Periods per week.	Course number.*
ROOFS AND BRIDGES	2	691
MACHINE DESIGN	3	1012
THERMODYNAMICS	4	1024
INDUSTRIAL MANAGEMENT	2	1061
SPANISH (optional)	2	144
ITALIAN (optional)	2	154
BIBLE	1	244
THEME	1	62

Second Term.

ECONOMICS	2	371
ENGLISH	2	5
BUSINESS LAW	2	363
THERMODYNAMICS	3	1024
TURBINES	3	1022
MACHINE DESIGN	3	1012
SPANISH (optional)	2	145
ITALIAN (optional)	2	155
BIBLE	1	242–43
THEME	1	62

Third Term.

HEATING AND VENTILATION	4	1051
TURBINES	3	1022
MACHINE DESIGN	3	1012
ELECTIVE	2	——
ENGLISH	2	6
SPANISH (optional)	2	146
ITALIAN (optional)	2	156
THESIS	2	1072
BIBLE	1	242–43

---

* See pages 91–144.

THE CHEMICAL COURSE.

The aim of this course, which leads to the Degree of Bachelor of Science in Chemistry, is to fit young men as chemical engineers for practical work in chemistry, either as chemists in iron and steel works, in manufacturing establishments, or as chemical manufacturers. Great attention is paid to analytical chemistry, and especially to the chemistry of cement and the chemistry and metallurgy of iron and steel. Graduates are fitted to take paid positions as chemists immediately upon graduation. For men of the proper character immediate and remunerative employment can be secured. This course will also be found an excellent preparation for the study of medicine.

Those who take the Chemical Course receive the same instruction in mathematics, drawing, shop-work, modern languages, physics and elementary chemistry up to and including elementary quantitative analysis during Freshman and Sophomore years as the engineering students.

During Junior and Senior years the courses diverge. Those especially interested in metallurgy and in the chemistry of cements and ceramics receive most of their instruction from Professors Hart and Wysor.

Those interested in Organic Chemistry are in charge of Professor Hart and Mr. Ross. Those interested in Physical Chemistry are instructed by Mr. De Long with the coöperation of Professor Gordon, of the Department of Physics. Those who expect to be Chemical Engineers are advised by Professors Hart and Wysor with the assistance of Professor Rood, of the Engineering Department, while those interested in tanning will receive instruction from Professor Hart and Mr. Ross with the coöperation of Professor Davison, of the Department of Biology.

Provision is made for new courses as the need arises. This is possible because the instruction is mainly individual and suited to the needs of each student.

While the instruction centers in the two branches of Chemistry and Metallurgy, the course aims to supply a thorough education along the lines most necessary for a successful career as a responsible chemist.

CHEMICAL AND METALLURGICAL LABORATORIES AND EQUIPMENT.

The Chemical and Metallurgical laboratories are contained in Gayley Hall, a fire-proof structure built for the use of this Department. There are four large and four smaller laboratories and a shop, besides three stock rooms, two balance rooms, two quiz rooms, a lecture room, a room containing the museum and the books of the Henry W. Oliver Chemical and Metallurgical Library, and three rooms for instructors.

The two balance rooms adjoin the quantitative laboratory, and one of them may be entered from the qualitative laboratory.

Two large laboratories each have desk room for 48 students. The qualitative laboratory has desk room for 88 students and the beginners' laboratory for 232. Water and gas are supplied to each student, and each room is supplied with air blast and electric current.

They are well lighted, and heated by steam. The smaller laboratories are arranged for assaying, industrial work, gas analysis, microscopic and photographic work, and various other determinations made with the polariscope, spectroscope, calorimeter, etc. For this and other work properly belonging to the department, there is an adequate equipment.

SYNOPSIS OF STUDIES.

CHEMICAL COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA	2	401
TRIGONOMETRY	2	411
CHEMISTRY	4	911
GERMAN†	4	75
OR		
FRENCH‡	4	113
ENGLISH	2	1
DRAWING AND LETTERING	2	441*a*–442
THE BIBLE	1	221
HYGIENE	1	580

Second Term.

	Periods per week.	Course number.*
ALGEBRA	3	401
TRIGONOMETRY	2	411
CHEMISTRY	2	912
FRENCH†	4	111
FRENCH‡	4	114
ENGLISH	2	2
DRAWING AND PROJECTION	2	441*b*–443*a*
THE BIBLE	1	222

* See pages 91–144.

† Entered on German.

‡ Entered on French.

Third Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY	4	416
MENSURATION	1	421
CHEMISTRY	2	913
FRENCH†	4	112
GERMAN‡	4	71
ENGLISH	2	3
DRAWING AND PROJECTION	2	441*c*–443*b*
THE BIBLE	1	223
THEME	1	63

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS	3	426
CHEMISTRY	6	914
PHYSICS	4	472
SHOP WORK	2	1001
THE BIBLE	1	224
THEME	1	62

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS	5	427
CHEMISTRY	6	915
PHYSICS	4	473
SHOP WORK	2	1001
THE BIBLE	1	225
THEME	1	62

Third Term.

CHEMISTRY	6	916
PHYSICS	4	474
CHEMICAL ARITHMETIC	3	917
SHOP WORK	2	1001
THE BIBLE	1	226
THEME	1	62, 63

---

* See pages 91–144.

† Entered on German.

‡ Entered on French.

GAYLEY LABORATORY OF CHEMISTRY AND METALLURGY.

JUNIOR YEAR.

First Term.

	Periods per week.	Course number.*
CRYSTALLOGRAPHY	2	511
QUANTITATIVE ANALYSIS	5	918
THEORETICAL CHEMISTRY	2	919
ORGANIC CHEMISTRY	4	920
METALLURGY	2	951
TECHNICAL GERMAN	1	961
SPANISH (optional)	2	141
ITALIAN (optional)	2	151
BIBLE	1	233
THEME	1	62

Second Term.

PETROGRAPHY	2	512
QUANTITATIVE ANALYSIS	5	931
THEORETICAL CHEMISTRY	2	924
ORGANIC CHEMISTRY	4	921
METALLURGY	2	952
TECHNICAL GERMAN	1	962
SPANISH (optional)	2	142
ITALIAN (optional)	2	152
BIBLE	1	234
THEME	1	62

Third Term.

QUANTITATIVE ANALYSIS	4	932
THEORETICAL CHEMISTRY	2	925
ORGANIC CHEMISTRY	4	922
MINERALOGY	3	513
SANITARY BIOLOGY	2	561
TECHNICAL GERMAN	1	963
SPANISH (optional)	2	143
ITALIAN (optional)	2	153
BIBLE	1	235
THEME	1	62

* See pages 91–144.

SENIOR YEAR.

First Term.

	Periods per week.	Course number.*
QUANTITATIVE ANALYSIS	10	933
CHEMICAL ENGINEERING	2	934
GEOLOGY	2	516
ENGLISH	2	4
TECHNICAL GERMAN	1	964
SPANISH (optional)	2	144
ITALIAN (optional)	2	154
BIBLE	1	244
THEME	1	62

Second Term.

ANALYTICAL CHEMISTRY (Thesis Work)	4	971
CHEMICAL TECHNOLOGY	2	935
ASSAYING	2	955
GEOLOGY	2	517
ECONOMIC GEOLOGY	2	521
ECONOMICS	2	371
ENGLISH	2	5
TECHNICAL GERMAN	1	965
SPANISH (optional)	2	145
ITALIAN (optional)	2	155
BIBLE	1	242–43
THEME	1	62

Third Term.

ANALYTICAL CHEMISTRY (Thesis Work)	12	972
ECONOMIC GEOLOGY	2	521
TECHNICAL GERMAN	1	966
ENGLISH	2	6
SPANISH (optional)	2	146
ITALIAN (optional)	2	156
BIBLE	1	242–43

* See pages 91–144.

COURSES.

ENGLISH LANGUAGE, ENGLISH LITERATURE, COMPARATIVE PHILOLOGY.

Professors F. A. March, Jr., J. W. Tupper, and Messrs. Hench, Nickel, Hutchins and Knowlton.

The work in this department aims, first, to train the student in speaking and writing English correctly. This training begins with the theme work in the Freshman year and is continued throughout the course.

The work in the upper classes is divided into the study of the language and the study of the literature. Its purpose is the interpretation of masterpieces, the rethinking of the thoughts of master minds. The study of the language consists of a study of the principles of grammar, rhetoric, etymology, phonetics, prosody, and other material of philological investigation according to the progressive course outlined in Dr. March's Method of Philological Study of the English Language and the application of the results of such work to the text of some standard author. Bunyan, Spenser, Chaucer, Shakespeare, Bacon and Milton are taken up in this way, and courses in fiction and the drama are given associated with an examination of the language of some novel or play. This course ends with the study of Dr. Whitney's Lectures on Language.

The work in English Literature consists of a course of lectures beginning with the Elizabethan period and continuing down to the present time. The course extends over the Junior and Senior years and is accompanied by special reading and by weekly and term reports.

Dr. March's Anglo-Saxon Grammar and Reader is used as the basis for a course in Anglo-Saxon given in connection with the study of the English Language.

For training in speaking and writing English correctly every student is required to hand in two themes in every term in his College course after Freshman year. Many of them are read in class and criticized as time allows. In this work professors of all departments take part. It is desired that students in each department shall write on subjects connected with it in the words and phrases current among experts, and know the precise meaning of these words and phrases. In these matters the professors in each department are authorities.

1–2–3. COMPOSITION AND RHETORIC. Themes. Conferences every two weeks. Outside reading. First, second and third terms, Freshman year. Two periods per week.

4–5–6. ENGLISH FOR ENGINEERS AND CHEMISTS.—Recitations based on Sypherd's *Handbook of English for Engineers*, discussions of articles in the technical journals, especially *The Engineering News* and *Power*, and the writing of weekly themes on subjects of a technical nature. First, second, and third terms, Senior year. Two hours a week.

10. ANGLO-SAXON.—Anglo-Saxon Grammar and Reader. Second term, Sophomore year. Two periods per week.

11–12–13. ADVANCED ANGLO-SAXON.—Preparation: **10.** March's Anglo-Saxon Grammar and Reader and additional reading as assigned. Gilbert prize in Old English (see page 179). First, second and third terms, Junior or Senior year. One period per week.

14. ENGLISH LANGUAGE.—Trench on the study of Words. Trench Prize (see page 178). First term, Sophomore year. Two periods per week.

16. English Language.—Bunyan's Pilgrim's Progress, English Syntax, Rhetorical Forms, Grammatical Equivalents, Essays on Bunyan's Life, Times and Works. First term, Sophomore year. Two periods per week.

17. English Language.—Spenser's Faery Queen, Etymology, Romance of Chivalry, Spenserian Stanza, Essays on Spenser's Life, Times and Works. Second term, Sophomore year. Two periods per week.

18. English Language.—Chaucer's Canterbury Tales, Phonetics Orthographic Forms, Essays on Chaucer's Life, Times and Works. Lounsbury Prize (see page 177). Third term, Sophomore year. Four periods per year.

19. English Language.—Shakespeare. Lectures, Weekly Essays on Shakespeare's Life, Times and Works. Two periods per week. Francis Bacon: Study of the Essays. Lectures, Weekly Essays on Bacon's Life, Times and Works. First term, Junior year. Two periods per week.

20. English Language.—Shakespeare. Study of Hamlet and other Shakespearean Tragedies. Two periods per week. John Milton: Study of His Poetic Works. Weekly Essay. on Milton's Life, Times and Works. Two periods per week. Second term, Junior year.

21. English Language.—Study of As You Like It and other Shakespearean Comedies. Lectures, Weekly reports, Dramatic Criticism. Shakespeare Prize (see page 181). Two periods per week. Oliver Wendell Holmes. Essays and reports on Holmes's Times and Works. Two periods per week. Third term, Junior year.

22. English Language.—English Fiction. Lectures, Assigned Reading, Book Criticism, Weekly Essays. Two periods per week. Robert Louis Stevenson. Essays on Stevenson's Times and Works. Two periods per week. The Francis A. March Prize (see page 176). First term, Senior year.

23. English Language.—The English Drama. Lectures and required reading. Two periods per week. English Fiction (continued). Two periods per week. Second term, Senior year.

24. English Language.—The English Drama. Study of Assigned Texts. Lectures. Weekly Reports. Two periods per week. English Fiction (concluded). Two periods per week. Third term, Senior year.

30–31. Comparative Philology.—Whitney's Language and the Study of Language. Third term, Senior year. Three periods per week.

41–42. English Literature.—Lectures on the drama from its beginnings till the closing of the theatres in 1642. Weekly reports, assigned reading. First and second terms, Junior and Senior years. Four hours a week.

43. English Literature.—Lectures on the drama from the Restoration to Sheridan. Weekly reports, assigned reading. Third term, Junior and Senior years. Four hours a week.

44. The Romantic Poets, 1790–1832.—Lectures, Weekly reports, Assigned reading. First term, Junior and Senior years. Four periods per week.

45–46. Later Nineteenth Century Literature.—Lectures, Weekly reports, Assigned reading. Second and third terms, Junior and Senior years. Four periods per week.

In connection with 43 and 46 a course in Metrics is given to the Juniors during the Senior vacation.

41–42–43. Given in 1914–15.

44–45–46. Given in 1913–14.

ELOCUTION.

Prof. March, Jr., and Mr. Nickel.

51–52. Elocution.—Delivering of selected pieces. Required in the Classical and Latin Scientific Courses. Optional in all others. Second and third terms, Freshman year.

53–54–55. Elocution.—Delivering of selected pieces. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. First, second and third terms, Sophomore year.

56–57–58. Elocution.—Delivering of original addresses on chosen subjects. Required in the Classical, Latin Scientific and

General Scientific Courses. Optional in all others. First, second and third terms, Junior year.

59–60. ELOCUTION.—Delivering of unwritten addresses on current events, followed by class discussion. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. First and second terms, Senior year.

61. ELOCUTION.—Graduating Orations. Required in the Classical, Latin Scientific and General Scientific Courses. By special appointment in all others. Third term, Senior year.

THEME.

62. Every student is required to hand in each term a theme upon a subject assigned by one of the departments.

63. Every technical student who does not take the Summer School in Surveying, is required to present a Theme, typewritten upon sheets 8 x $10^1/_2''$ in size, of not less than 2500 or more than 5000 words, upon a subject approved by the head of his department, on or before the Monday following the opening day of each fall term.

GERMAN AND ROMANCE LANGUAGES.

Professors Raschen and Hopkins and Messrs. Boethius, Bailey, Gable and Schwarz.

GERMAN.

Courses **71, 72** are prescribed for technical students who have entered on French. **75** is prescribed for technical students who have entered on German.

71. ELEMENTS OF GERMAN.—Elements of Grammar and Syntax. Prose Composition followed by reading of easy narrative German prose. Second term, Freshman year. Four periods per week.

72. INTERMEDIATE GERMAN.—Preparation: **71.** Reading of narrative prose of difficult character. Composition. Third term, Freshman year. Four periods per week. (Not given 1913–14.)

75. ADVANCED GERMAN.—Preparation: Entrance German B.—Composition and reading from modern writers as Riehl, Wildenbruch, Fulda, etc., and the translation of easy scientific German. Part of the term will be devoted to reading of scientific German of an advanced character. First term, Freshman year. Four periods per week.

80. ELEMENTS OF GERMAN.—Prescribed for Sophomores in the Classical Course. This Course, in conjunction with Course 81, aims to give a thorough and accurate training in the rudiments of Grammar; to familiarize the student with spoken as well as written German; for this reason the direct method will be employed, using German entirely from the beginning. The student is thereby made to acquire both "Sprachgefuehl" and "Sprachmaterial" so as to understand and speak German with ease. Dictation, composition and translation of easy graduated text forms part of the exercise each hour. Third term, Sophomore year. Three periods per week.

81. ELEMENTS OF GERMAN.—(Continued.)—Prescribed for Juniors in the Classical Course. First term, Junior year. Three periods per week.

82–83. INTERMEDIATE GERMAN.—Preparation: 81. Reading of novels and dramas by modern writers such as Heyse, Keller, Fulda, Mörike, Sudermann. Second and third terms, Junior year. Two periods per week.

84–85–86. ADVANCED GERMAN.—Preparation: Entrance, German B. Prescribed for Freshmen in the Latin Scientific and General Scientific Courses who have entered with German. The study of accidence, syntax and etymology will form part of this course which will be carried on by the direct method. Composition as well as reading of advanced texts, which will be selected so as to vary the reading and to acquaint the student with a variety of styles of German writers. In addition to this an easy text will be assigned for outside reading during the second and third terms. First, second and third terms, Freshman year. Four periods per week.

87–88. NINETEENTH CENTURY WRITERS.—Preparation: 86. Prescribed for Sophomores in the Latin Scientific and General

Scientific Courses who have entered with German. This course consists of advanced composition and of the study of Prose-fiction of the 19th century. The classes will be conducted in German as far as practicable. First and second terms, Sophomore year. Two periods per week.

89. HISTORICAL PROSE.—Preparation: **88.** Prescribed for Sophomores who have entered on German. Selected readings from German historical writers, and from addresses in the Reichstag. Third term, Sophomore year. Two periods per week.

90–91–92. SCHILLER AND GOETHE.—Preparation: 89. The lives and several of the principal works of these authors will be studied. Lectures on the various aspects of these works are given to supplement the studies and readings in biography and criticism assigned. Elective. First, second and third terms, Junior year. Two periods per week.

93–94–95. GOETHE'S FAUST.—Preparation: **92.** Alternates with **96–98.** The reading and interpretation of Faust, the First Part in its entirety, the Second Part in selected portions. The study will comprise its genesis, significance, ethics, and artistic character. It is open to those who have completed the course on Goethe. Elective. First, second and third terms, Senior year. Two periods per week.

96–97–98. HISTORY OF THE GERMAN DRAMA OF THE 19TH CENTURY.—Preparation: **87–89.** The reading and criticism of the various types of modern drama together with a study of their sources and influence. (Alternates with **93–95.**) Elective. First, second and third terms, Senior year. Two periods per week.

99–100–101. HISTORY OF THE GERMAN NOVEL; from the beginnings to the 19th century. Lectures on, criticism of and collateral readings on the most important types of the German novel. Three terms, Senior year. Two periods.

102–103–104. TEACHER'S COURSE.—Preparation: **89** (or subsequent courses). This course is intended for those who are planning to teach German. Lectures on and discussions of methods and organization. Treatment and systematization of difficulties of German grammar. One hour per week through Senior year.

FRENCH.

Courses 111, 112 are prescribed for technical students who have entered on German.

111. ELEMENTARY FRENCH.—Prescribed for technical students entering on German. Principles of grammar and syntax; prose composition in connection with reading of easy narrative French prose. Second term, Freshman year. Four periods per week.

112. INTERMEDIATE FRENCH.—Continuation of 111. Reading from scientific prose. Third term, Freshman year. Four periods per week.

113–114–115. ADVANCED FRENCH.—Prescribed for students who have entered on French. Review of grammar; reading of standard authors; prose composition. First, second and third terms, Freshman year. Four periods per week.

116–117–118. ADVANCED FRENCH.—Continuation of the foregoing. Prescribed for Sophomores in the Latin Scientific and General Scientific Courses who have entered on French. Modern plays. Newspaper French. Composition. First, second and third terms, Sophomore year. Two periods per week.

119–120–121. ADVANCED FRENCH.—Open to those who have completed the six foregoing courses. Modern prose. Modern plays. Conversation based on Kron's *French Daily Life*. First, second and third terms, Junior year. Two periods per week.

122–123–124. ADVANCED FRENCH.—Open to those completing the preceding three courses. French for Teachers. Advanced composition. French Commercial Correspondence. First, second and third terms, Senior year. Two periods per week.

125. ELEMENTARY FRENCH.—Prescribed for Sophomores in the Classical Course and those in the Latin Scientific and General Scientific Courses offering German for entrance. Grammar, composition, sight reading and translation of easy prose; careful drill in pronunciation. First term, Sophomore year. Two periods per week.

126. Elementary French.—Continuation of 125. Thorough study of irregular verbs, grammar, composition, translation and sight reading. Second term, Sophomore year. Two periods per week.

127. Intermediate French.—Continuation of 126. Translation and sight reading from Guerlac's *Standard French Authors* or similar books; discussion of the various works of the authors represented; prose composition. Third term, Sophomore year. Two periods per week.

128. French History.—Reading of selections from various historians. Discussions. First term, Junior year. Two periods per week.

129. Modern French Novel.—Selections from Dumas *père,* Hugo, George Sand, Zola, etc. Lectures. Second term, Junior year. Two periods per week.

130. Literature of the Seventeenth Century.—Collateral reading in History of French literature. Delpit's *L'Age d'Or de la Littérature Française.* Third term, Junior year. Two periods per week.

131. French Tragedy.—Study of the tragedy from Corneille to Rostand. Lectures. First term, Senior year. Two periods per week.

132. French Comedy.—Molière to Dumas *fils.* Lectures. Second term, Senior year. Two periods per week.

133. French.—The Romantic Drama. Hugo's *Hernani* or *Ruy Blas.* Lectures. Third term, Senior year. Two periods per week.

134. French Literature of the Sixteenth Century.—Selections from Ronsard, Marguerite de Valois, Marot, Jodelle, etc. The Pléiade. Alternates with 133. Third term, Senior year. Two periods per week.

135, 136. Historical French Grammar.—Development of French from Latin. Alternates with 132, 133. Second and third terms, Senior year. Two periods per week.

SPANISH.

141. ELEMENTARY COURSE.—Pronunciation, inflection, the laws of syntax and their application. Translation of simple prose; oral exercises and composition. First term, Junior year. Two periods per week.

142. ELEMENTARY COURSE.—(Continued.)—Grammar, reading, composition, conversation. Second term, Junior year. Two periods per week.

143. MODERN PROSE.—Translation and sight reading from the works of such authors as Alarcón, Becquer, Valera, Galdés. Continued composition and oral drill. Third term, Junior year. Two periods per week.

144. MODERN PLAYS.—Reading of plays of Echegaray, Gil y Zarate, Moratín. Composition. First term, Senior year. Two periods per week.

145. THE NOVEL OF THE SIXTEENTH AND SEVENTEENTH CENTURIES.—Selections from *Don Quixote*. History of the period. Second term, Senior year. Two periods per week.

146. AMERICAN SPANISH LITERATURE.—Poems in *Bardos Cubanos*. Spanish Correspondence. Third term, Senior year. Two periods per week.

ITALIAN.

151. ELEMENTARY COURSE.—Principles of grammar, pronunciation, inflection, simple prose translation, oral exercises and composition. First term, Junior year. Two periods per week.

152. ELEMENTARY COURSE.—(Continued.)—Further grammar, composition and oral work; Bowen's *Italian Reader*. Second term, Junior year. Two periods per week.

153. MODERN NOVEL.—Translation and sight reading from Manzoni's *I Promessi Sposi* and works of similar grade. Composition continued. Third term, Junior year. Two periods per week.

154. ITALIAN OF DANTE.—Reading of selected canti of the *Divina Commedia*. A study of Dante and his place in Florentine history. First term, Senior year. Two periods per week.

155. BOCCACCIO.—Selections from Fornaciari's edition of the *Decamerone* will be read. Discussions concerning the common

origin of some of these tales. Second term, Senior year. Two periods per week.

156. PETRARCH.—Translation from the edition of Carducci and Ferrari. Study of the sonnet, madrigal, *canzone*, etc. Third term, Senior year. Two periods per week.

THE GREEK LANGUAGE AND LITERATURE.

Professors Youngman (Professor Emeritus) and Rankin.

The aim in the Greek courses leading to the A.B. degree is to secure a mastery of the language, for which an exact knowledge of forms of words and of the essential principles of syntax is indispensable. Particular attention is paid to the study of Greek prose during the first term of Freshman year. A correct understanding of the significance of words is also sought through the study of their inherent root meanings, while Greek idioms and forms of expression are learned by way of contrast with those of the Latin and English languages.

But the chief end in view is to acquire an appreciation of Greek literature and, through this medium, of the Greeks themselves. The History of Greek literature is learned through association of authors with contemporaneous historical events. The political history and institutions of the Greeks, their daily life, their customs and their religious beliefs are studied hand in hand with their language and literature. The student is encouraged to read largely in the representative authors selected for study in the class room. Themes on subjects drawn from various phases of Greek life are required in connection with the regular work. In this way the close relationship of the Greek of Classical times and the man of to-day is more perfectly realized.

In the required work of the first two years the prose writers are represented in the reading of the early Attic orators, of Herodotus, of Xenophon, and of Plato. In poetry large parts of both Iliad and Odyssey are read, and the student is introduced to the Greek drama in plays of Sophocles, Euripides and Aristophanes.

In the elective Greek, for the present courses are offered to qualified Juniors and Seniors, four hours a week, throughout the year.

For 1914–1915 the courses offered will comprise the study of Demosthenes, *On the Crown*, and Aeschines, *Against Ctesiphon*, and the reading of selected plays of Sophocles and Aeschylus. The reading of the Greek authors will be accompanied by parallel reading in the history and constitutional antiquities of the period represented and in the origin and development of the Greek drama. During 1915–1916 courses will be offered in selected plays of Aristophanes and Menander, representing the Old and the New Comedy, in Thucydides, and in the Lyric poets and Theocritus.

Additional courses will be offered, by way of substitution, from time to time in Lucian, in Aristotle's Poetics and Constitution of Athens and in Plato's Protagoras and Republic.

Following is a synopsis of the courses offered:

161. LYSIAS, the oration against Eratosthenes and some of the shorter orations (Adams). Plato, *The Apology,* and Xenophon, selections from the *Memorabilia* (Dyer and Seymour). Greek Prose Composition (Spieker). First term, Freshman year. Four periods per week.

162. HERODOTUS, books VII and VIII (Smith and Laird). "A History of Greece," Oman, to Chapter XXVIII (the death of

Pericles, 429 B. C.). Second term, Freshman year. Four periods per week.

163. Homer, *The Iliad*, books XIX–XXIV (Clapp). "A History of Greece," Oman, from the death of Pericles to the death of Alexander the Great, 323 B. C. Third term, Freshman year. Four periods per week.

164. HOMER, *The Odyssey*, books I–XII (Merry). "Life of the Ancient Greeks," Gulick. Themes on Greek life. First term, Sophomore year. Four periods per week.

165. "SELECTIONS FROM THE ATTIC ORATORS" (Jebb). "Greek Literature," Wright. Themes based on the study of the Greek orators. Second term, Sophomore year. Four periods per week.

166. INTRODUCTION TO THE GREEK DRAMA. Sophocles, *Antigone* (Bayfield); Aristophanes, *The Clouds* (Merry). "Greek Literature," Wright. Themes on the history of the Greek Drama and on scenic antiquities. Third term, Sophomore year. Four periods per week.

167. DEMOSTHENES, *On the Crown* (Humphreys), and Aeschines, *Against Ctesiphon* (Richardson). Review of the period of Philip and Alexander. Greek Constitutional Antiquities. Elective. First term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1914–1915.)

168. GREEK TRAGEDY. Sophocles, *Oedipus the King* (Jebb), *Oedipus at Colonus* (Jebb and Schuckburgh), and *Electra* (Jebb and Davies). Parallel reading in works on the Greek Drama. Elective. Second term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1914–1915.)

169. GREEK TRAGEDY. Aeschylus, *Prometheus Bound* (Prickard), *Seven against Thebes* (Sidgwick), *Eumenides* (Sidgwick). Parallel reading. Elective. Third term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1914–1915.)

170. GREEK COMEDY. Aristophanes, *Birds*, *Frogs*, and *Acharnians* (Merry). Menander, fragmentary plays (Capps).

Lectures on the history of Greek Comedy. Elective. First term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1915–1916.)

171. THUCYDIDES, books VI and VII (Lamberton). Review of the period of the Sicilian Expedition. Elective. Second term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1915–1916.)

172. LYRIC POETS, selections (Tyler). Theocritus (Cholmeley). Elective. Third term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1915–1916.)

For students who do not offer Greek for entrance the following courses are available and may be substituted, throughout the year, for certain other courses in the College curriculum. (See pages 38 and 46.)

173. BEGINNER'S GREEK BOOK (Benner and Smythe). Xenophon, *Anabasis,* books I and II (Smith). Greek Prose Composition (Pearson). Freshman year, four periods per week, through the entire year.

174. XENOPHON, *Anabasis,* books II–IV (Smith). Homer, *The Iliad,* books I–III and selections (Sterrett). Greek Prose Composition (Pearson). Themes. Sophomore year, four periods per week, through the entire year.

For students who begin the study of Greek in College and successfully complete the courses of the first two years the following courses are offered in satisfaction of the requirements for the A.B. degree:

175. Homer, *The Odyssey,* selections from books I–XII (Merry). Herodotus, books VII and VIII (Smith and Laird). "A History of Greece," Oman, to chapter XXI (the battle of Mycale, 479 B. C.). First term, Junior year. Four periods per week.

176. Thucydides, books VI and VII (Lamberton). "A History of Greece," Oman, to chapter XXXIV (fall of the Four Hundred, 411 B. C.). Second term, Junior year. Four periods per week.

177. Plato, *The Apology* and *Crito*, with selections from the *Phaedo* and *Symposium* and from Xenophon's *Memorabilia* (Dyer and Seymour). "A History of Greece," Oman, from the fall of the Four Hundred to the death of Alexander the Great, 323 B. C. Third term, Junior year. Four periods per week.

178. "Selections from the Attic Orators" (Jebb). "Life of the Ancient Greeks" (Gulick). First term, Senior year. Four periods per week.

179. Euripides, *Iphigenia among the Taurians* (Jerram). Sophocles, *Antigone* (Bayfield). "Greek Literature," Wright. Second term, Senior year. Four periods per week.

180. Aeschylus, *Prometheus Bound* (Prickard). Aristophanes, *The Frogs* (Merry). "Greek Literature," Wright. Third term, Senior year. Four periods per week.

THE LATIN LANGUAGE AND LITERATURE.

Professor Owen and Messrs. Lacey and Nickel.

It is the aim of this Department to give the students an intelligent acquaintance with the language, literature and institutions of Rome, and qualify them for the efficient treatment of these subjects as teachers, or for the further scholarly pursuit of these and kindred studies after graduation if they should be so disposed. An effort is made to unite accuracy in details with facility in reading within the limits of a reasonable range.

It is kept in mind, also, that the training in this Department should be practically helpful and valuable to those who are to speak and write the English language. With a view to cultivate the power of expression, besides the oral work of the class room, there are frequent exercises in writing, in which it is sought to faithfully render the author into the English of our literary standards.

181. LIVY.—Books XXI–XXII, with Roman History and Latin Prose. First term, Freshman year. Four periods per week.

182. HORACE.—Odes and Epodes. Latin Prose. Second term, Freshman year. Four periods per week.

183. HORACE.—Satires and Letters with Roman Antiquities. Third term, Freshman year. Four periods per week.

184. CICERO.—DeOratore with history of the last Century of the Roman Republic. First term, Sophomore year. Four periods per week.

185. LATIN HYMNS.—Latin Hymns with Early Roman Literature. Second term, Sophomore year. Four periods per week.

186. CICERO.—De Officiis. Third term, Sophomore year. Two periods per week.

187. TACITUS.—Agricola and Germania. Roman Literature of the Silver age. First term, Junior year. Two periods per week.

188. JUVENAL.—Roman Archaeology, illustrated by an Extensive Collection of Roman photographs. Second term, Junior year. Two periods per week.

189. TACITUS.—Annals. Third term, Junior year. Two periods per week.

190. LUCRETIUS.—First term, Senior year. Two periods per week.

191. EPISTOLARY LATIN.—Pliny and Cicero. Second term, Senior year. Two periods per week.

192. CICERO'S TUSCULAN DISPUTATIONS.—Third term, Senior year. Two periods per week.

THE HEBREW LANGUAGE.

Rev. Robert Robinson.

201. ELEMENTARY HEBREW.—Etymological principles of Hebrew; inflections and laws of euphonic changes. Elective. Second term, Senior year. Two periods per week.

202. HEBREW (Continued).—Translation of portions of Old Testament History from Hebrew into English, and from English into Hebrew. Elective. Third term, Senior year. Two periods per week.

THE BIBLE.

The President, Professors Youngman, Owen, Raschen, Roberts, Lyle, Rankin, Martin, Hopkins, Marquard and Messrs. Lacey, Cawley, Hatch, Boethius, Snyder, Hench, H. Eichlin and Nickel.

In the Freshman year a general survey of the Bible will be made with the purpose of impressing upon the students the character of its contents, the various books and their relation to the whole, and familiarizing them with its actual language and ideas. So far as may be profitable for this dominant purpose, instruction will be given in Bible history and geography, but the great object is to make the student familiar with the very words of the English Bible.

The Sophomore year is devoted to a detailed study of one of the synoptic gospels. Those who study Greek use the Greek Testament; those taking the Latin Scientific course, a Latin version

The Acts of the Apostles is studied in the Junior year by all except the Latin Scientific Juniors, who pursue a general course upon the plan of Redemption. Special attention is given to the lives and labors of the Apostles and the founding of the Christian Church.

In the Senior year the first half year is devoted to a course in the early history of Christianity in which Uhlhorn's Conflict of Christianity with Heathenism is the text-book; the second half to the external history of the English Bible, its translators and translation.

221–22–23. THE BIBLE.—General survey of the Old Testament and the Life of Christ. Required of all students throughout the Freshman year. One period per week.

224–25–26. THE NEW TESTAMENT.—The Gospels. Required of Technical students throughout the Sophomore year. One period per week.

227–28–29. THE NEW TESTAMENT.—The Gospels, in Greek. Required of Classical students throughout the Sophomore year. One period per week.

230–31–32. THE NEW TESTAMENT.—The Gospels, in Latin. Required of Latin Scientific students throughout the Sophomore year. One period per week.

233–34–35. THE NEW TESTAMENT.—The Acts of the Apostles. Required of Technical and General Scientific students throughout the Junior year. One period per week.

236–37–38. THE NEW TESTAMENT.—The acts of the Apostles in the Greek. Required of Classical students throughout the Junior year. One period per week.

239–40–41. THE PLAN OF REDEMPTION.—Required of Latin Scientific students throughout the Junior year. One period per week.

242–43. CHURCH HISTORY.—Uhlhorn's Conflict of Christianity with Heathenism. Required of all Classical, Latin and General Scientific Seniors. Practical Ethics. Required of all Technical Seniors. Second and third terms, Senior year. One hour per week.

244. HISTORY OF THE ENGLISH BIBLE.—Required of all Seniors. First term, Senior year. One period per week.

PHILOSOPHY.

Professor Martin.

The required courses in Philosophy are Psychology, Logic, Ethics, Theism. These are presented as a continuous course, beginning with the second term of the Junior year, and extending to the end of the Senior year. In addition to these required courses, elective courses are offered in the principles of Philosophy, and in the History of Philosophy. These courses cover the Senior year and are given two hours a week.

PEDAGOGY.—In connection with the courses in Philosophy provision is made for an adequate course in Pedagogical subjects.

In addition to the required psychology of the regular course two hours a week throughout the Junior or Senior year may be given to the History of Education, and Educational Psychology. The courses in Pedagogy are supplemented by lectures from distinguished educators actively engaged in public school work.

The course as presented amply covers the requirements of the Pennsylvania School Code for State Certificate.

251. LOGIC. In connection with Psychology during the third term, Junior year. Lectures and exercises.

252. PSYCHOLOGY. Three hours a week during the second and third terms of Junior year. Text book James' *Briefer Course*.

254. PHILOSOPHY.—Two hours a week during the first term of Senior year.

281. ETHICS. Three hours a week during the first term, Senior year. Text books. McKenzie, Paulsen, with lectures and discussion.

291. HISTORY OF PHILOSOPHY. Two hours a week during second and third terms, Senior year.

301. HISTORY OF EDUCATION. Two hours a week during first and second terms—open to Seniors and Juniors.

302. THEISM. Two hours a week during the second term, Senior year. Textbook. Flint's *Theism*.

303. EDUCATIONAL PSYCHOLOGY. Two hours a week during third term. Open to Seniors and Juniors.

LECTURES ON EDUCATION.—In view of the increased requirements for teachers embodied in this state, an effort has been made to extend the courses in education given in connection with the department of philosophy and to supplement these by others bearing more directly upon the practical side of the teacher's work.

HISTORY, POLITICAL AND SOCIAL SCIENCE.

The President, and Professors Owen, Roberts and Rankin, and Messrs. Lacey, Kirkpatrick, H. Eichlin, and Nickel.

The work of this department is designed to give such a general knowledge of History and Political Science as belongs to a liberal education. At the same time sufficient work is offered in the electives to well equip for their future work and study students who desire to take up graduate work or to engage in the practice of law or the public service or teaching. The instruction is given by text-books, by lectures, and by library references, the students reporting the results of their reading partly during the regular work of the class, and partly in the forms of essays. The subjects covered by the course are in detail as follows:

311. ANCIENT HISTORY. Survey of the history of Greece and Rome in connection with the courses in Latin and Greek. Political, social, literary and philosophical history of each epoch. Classical Geography.

312–14. Mediaeval and Modern European History.—These courses are treated as a continuous year's course in European History from 378 to 1913. First, second and third terms, Freshman year. Two periods per week.

321–23. AMERICAN HISTORY.—These courses are treated as a continuous year's course in American History from 1492 to 1913. (*a*) Course **321**, from 1492 to 1750, is a study of the discovery, exploration, and settlement of the continent, and the growth and development of colonial institutions. (*b*) Course 322, from 1750 to the downfall of the Federalist Party, treats of the growth of united action among the colonies, the establishment of the Federal Government, and the development of nationality. (*c*) Course 323, from the downfall of the Federalist Party to the present time, is an account of the development and expansion of the United States. First, second and third terms, Sophomore year. Two periods per week.

324. AMERICAN HISTORY FROM 1600 TO 1783.—An advanced study intended to trace the beginnings of our nation rather than the details of the history of the individual colonies. Emphasis is laid on the European inheritance brought to this country by the colonists, their social and political life, the expansion of population, the struggle between France and England, the causes of the Revolution, and the growth of union and independence. Elective. Second term, Junior year. Two periods per week.

331. HISTORY OF ENGLAND FROM THE NORMAN CONQUEST TO THE ACCESSION OF THE TUDOR DYNASTY.—The narrative history of England is made the basis of study, but especial attention is given to the economic, social and intellectual life of the people, and the development of English institutions. First term, Junior year. Two periods per week.

332. HISTORY OF ENGLAND FROM THE ACCESSION OF THE TUDOR DYNASTY TO 1688. Elective. Second term, Junior year. Two periods per week.

341. CONSTITUTIONAL HISTORY.—The United States. This is a required course in the Constitution of the United States. Fiske's Critical Period of American History is used as an introduction, and is followed by a critical study of the Constitution section by section with especial reference to its historical development and its subsequent interpretation and construction. Third term, Junior year. Two periods per week.

345-46. CONSTITUTIONAL HISTORY.—The United States (Continued). Preparation: 341. Detailed study of the subject, with Bryce's American Commonwealth as an introduction and general guide. Lectures, discussions and written reports on questions of American citizenship. Elective. Second and third terms, Senior year. Two periods per week.

351–53. POLITICAL SCIENCE AND COMPARATIVE GOVERNMENT.—(*a*) An introduction to political science, including a study of the origin of the state, and of the special significance of the terms state, government law, rights, and sovereignty. (*b*) A comparative study of the governmental systems of England, France, Germany and Switzerland. Constitutional and political changes in other countries are considered briefly. The course deals principally with the constitutions, organization of departments, political parties, and administrative practices. Elective. First, second, and third terms, Senior year. Two periods per week.

361–62. LAW.—Elective courses in Blackstone's Commentaries. Second and third terms, Senior year. Two periods per week.

363–64. BUSINESS LAW.—A study of the elementary principles of contracts, agency, partnerships, corporations, sales, insurance, estates, and negotiable paper. The aim of the course is to give a knowledge of the law which will be of service in the affairs of every day life. Elective. Second and third terms, Senior year. Two periods per week.

365. INTERNATIONAL LAW.—The course in International Law undertakes to do little more than to exhibit the fundamental principles which govern international affairs, and by the study of a few important cases to show the method of diplomatic procedure. It is especially intended to give the students the information needed to understand current discussions of foreign relations. Text-book—Hershey's Essentials of International Public Law. Elective. First term, Senior year. Two periods per week.

371. ECONOMICS.—An introduction to the elementary principles of Economics. Required. Second term, Senior year. Two periods per week.

372. ECONOMICS.—A continuation of Course 371. The application of economic principles to concrete problems—international

trade, money, currency and banking, capital and labor, transportation, state control of business activities and socialism—as these may be questions of contemporary interest. Required. Third term, Senior year. Two periods per week.

MATHEMATICS.

Professors Hardy, Hall and Marquard, and Messrs. Hatch, Cawley, Snyder, Bray and H. Eichlin.

It is strongly recommended that algebra be thoroughly reviewed just before admission to college.

401. Algebra.—Binominal theorem, theory of logarithms, probability, variables and limits, series and theory of equations. Text-book—Wentworth's College Algebra. First term, Freshman year, two periods per week. Second term, Freshman year. Three periods per week.

402. Algebra.—Preparation: Entrance Mathematics B. Through Ratio, Proportion and Variation. First term, Freshman year. Two periods per week.

403. Algebra Completed.—Preparation: **402.** (Continuation of **402.**) Second term, Freshman year. Four periods per week.

404. Algebra.—To Progressions. Second term, Freshman year. Four periods per week.

405. Algebra Completed.—(Continuation of **404.**) Third term, Freshman year. Four periods per week.

406. Geometry.—Solid Geometry. First term, Freshman year. Two periods per week.

407. Geometry.—Solid Geometry. First term, Freshman year. Four periods per week.

411. Trigonometry.—The work in this course begins with a rapid review of the elementary Plane Trigonometry. Then follows the advanced Plane Trigonometry, consisting of derivation of formulas and trigonometrical series, solution of right- and oblique-angled triangles and solution of problems involving the practical applications. About one-third of the term is devoted to Solid Trigonometry which is also completed. Text-book—Hall and Funk's Trigonometry. First Term, Freshman year. Two periods per week. Second term, Freshman year. Two periods per week.

412. TRIGONOMETRY.—Preparation: **403, 406.** Third term, Freshman year. Four periods per week.

413. TRIGONOMETRY.—Preparation: **405, 406.** First term, Sophomore year. Four periods per week.

416. ANALYTICAL GEOMETRY.—The work in this subject consists of the Analytical Geometry of two dimensions, including the point, right line and circle; the conics, tangents, diameters, transformation of coördinates, the general equation of the second degree and higher plane curves; also the Analytical Geometry of three dimensions, including the point, the plane and surfaces of revolution. Text-book—Ashton's Analytic Geometry. Third term, Freshman year. Four periods per week.

417. ANALYTICAL GEOMETRY (Continued).—First term, Sophomore year. Two periods per week.

418. ANALYTICAL GEOMETRY.—Preparation: **412.** Drawing of curves from their equations; accurate demonstrations of propositions. First term, Sophomore year. Four periods per week.

419. ANALYTICAL GEOMETRY.—Preparation: **418.** (Continuation of **418.**) Four periods per week. Second term, Sophomore year. Four periods per week.

420. ANALYTICAL GEOMETRY.—Preparation: **413.** Same as **418.** Second term, Sophomore year. Four periods per week.

421. MENSURATION.—The work includes the mensuration of the ordinary geometrical magnitudes, conic sections and curved surfaces and solids. The prismoidal formula, Simpson's rule, etc., are given. Text-book—Hall's Mensuration. Third term, Freshman year. One period per week.

426. DIFFERENTIAL AND INTEGRAL CALCULUS.—The work in the Differential Calculus consists of the differentiation of all the functions of one or more variables, successive differentiation, implicit functions, development of function, evaluation of indeterminate forms, maxima and minima, properties of curves and radius of curvature, together with numerous practical applications in Mechanics. In the Integral Calculus are treated the integration of rational, irrational and transcendental functions, integration by parts and successive integration, rectification of curves, quadrature of plane surfaces, surfaces and volumes of solids, centers of gravity of lines, surfaces, and solids, and moments of inertia. Text-book—Hall's Differential and Integral Calculus. First term, Sophomore year. Three periods per week.

427. DIFFERENTIAL AND INTEGRAL CALCULUS (Continued).—Second term, Sophomore year. Five periods per week.

429. DIFFERENTIAL CALCULUS.—Preparation: **419–420.** Elective. First term, Junior year. Four periods per week.

430. INTEGRAL CALCULUS.—Preparation: **429.** Elective. Second term, Junior year. Four periods per week.

431. CALCULUS.—Preparation: **430.** Application of the Calculus to the study of Loci. Elective. Third term, Junior year. Four periods per week.

432. DIFFERENTIAL EQUATIONS.—Preparation: **431.** Elective. First term, Senior year. Two periods per week.

433–44. THEORY OF FUNCTIONS.—Preparation: **432.** Elective. Second and third terms, Senior year. Two periods per week.

436. LEAST SQUARES.—Law of probability of error, adjustment of observations, precision of observations and empirical formulas. The problems are selected with particular attention to the needs of engineers. Text-book—Merriman's Least Squares. Third term, Sophomore year. Two periods per week, for half term.

437. DIFFERENTIAL EQUATIONS.—In this subject are given the principal differential equations of the first order and degree and those of the second order that are of importance in the applied mathematics that follow. Text-books—Hall's Differential and Integral Calculus. Third term, Sophomore year. Two periods per week.

TECHNICAL DRAWING AND DESCRIPTIVE GEOMETRY.

Professor Graves and Mr. Slantz.

441*a*. DRAWING.—Use of drawing instruments and materials; elementary plates of such a nature as to give the student practice in using drawing instruments and knowledge concerning the simpler operations of drawing; free-hand pen shading; conic sections. Text-book, "Mechanical Drawing"—Graves. First term, Freshman year. Two 2-hour exercises per week.

441*b*. DRAWING.—Plates concerning the projection, revolution, and successive revolution of geometric solids in connection with course 443*a*. Orthographic Projection; working drawings of machine details, and fastenings such as bolts, nuts and screw threads. Text-book, "Mechanical Drawing"—Graves. Second term, Freshman year. Two 2-hour exercises per week.

441*c*. DRAWING.—Drawings of large structures taken from detail sketches and uncompleted views—such as bent for a timber trestle, squared timber highway bridges, built up steel columns and girders; plates in connection with course 443*b*, Orthographic Projection, tracing and blue-printing. Text-book, "Mechanical Drawing"—Graves. Third term, Freshman year. Two 2-hour exercises per week.

442. LETTERING.—Analytical study of, and practice in, making lower case and capital letters suitable for general engineering drawing; the lettering of connected sentences to acquire facility in spacing; lettering suitable for titles. Text-book, "Freehand Lettering"—Reinhardt. First term, Freshman year. Two 1-hour exercises per week.

443*a*. ORTHOGRAPHIC PROJECTION.—Training the technical imagination and power of visualization in three dimensions through the projection, revolution, and successive revolution of geometric solids; direct application of the principles involved to mechanical drawing. Text-book, "Mechanical Drawing"—Graves. Second term, Freshman year. Two 1-hour recitations per week.

443*b*. ORTHOGRAPHIC PROJECTION.—A consideration of points and lines in their relations to one another and to the three planes of projection, in order to further develop the relationship of orthographic projection to the graphic language of mechanical drawing, and at the same time to lay a firm foundation for the subsequent study of Descriptive Geometry. Text-book, "Orthographic Projection"—Graves. Third term, Freshman year. Two 1-hour recitations per week.

451*a*. DESCRIPTIVE GEOMETRY.—Problems on the point, line and plane. Particular emphasis is laid on the necessity to mentally visualize the problem under discussion. Text-book, "Descriptive Geometry"—Hall. First term, Sophomore year. Two 1-hour recitations and 1 hour of drawing per week.

451*b*. DESCRIPTIVE GEOMETRY.—Generation and properties of surfaces of single and double curvature; intersections and developments of planes with solids and solids with solids; warped surfaces; tangent planes. Text-book, "Descriptive Geometry" —Hall. Lectures. Second term, Sophomore year. Two 1-hour recitations and 1 hour of drawing per week.

451*c*. DESCRIPTIVE GEOMETRY.—The applications of the principles of Descriptive Geometry to isometric drawing; shades and shadows; the shadows of isometric drawings; perspective drawing and shadows. Lectures, recitations, and drawings. Third term, Sophomore year. Two recitations and 1 hour of drawing per week.

452. MACHINE DRAWING.—Neat, free-hand sketches of actual pieces of machinery such as pulleys, gears, shaft hangers, pistons, valves, eccentrics, etc. From these sketches, drawings, and tracings are made; class room work on the elements of machine design. Third term, Sophomore year. Two 2-hour exercises per week.

PHYSICS.

Professor Gordon and Messrs. Lockwood, Balderston and C. Eichlin.

Physics is required of all candidates for a degree, four periods per week for one year.

Two additional periods per week are required of students in the Electrical Engineering course during the Sophomore year.

Students in the general courses may take elective work in the subject in third term of Junior year and throughout the Senior year.

Courses 461–463 constitute the required work of those in Classical, Latin Scientific and General Scientific courses.

461. LIGHT AND SOUND.—Two lectures, two recitations and two 2-hour laboratory periods per week. Third term, Sophomore year.

462. MECHANICS AND HEAT. Two lectures, two recitations and two 2-hour laboratory periods per week. First term, Junior year.

463. ELECTRICITY AND MAGNETISM. Two lectures, two recitations and two 2-hour laboratory periods per week. Second term, Junior year.

Courses 464–471 are elective. A two-hour lecture and recitation course and a laboratory course requiring two 2-hour periods per week are given each term. Students expecting to teach Physics should take all these courses, but either one or both may be elected any term.

464. APPLIED ELECTRICITY.—Dynamos, motors, electric lighting, wireless telegraphy, induction coils, etc. Two recitations per week. Third term, Junior year.

465. ELECTRICAL MEASUREMENTS.—Inductance and capacity, efficiency of dynamos and motors, photometry, etc. Two 2-hour laboratory periods per week. Third term, Junior year.

466. THEORY OF IONS AND ELECTRONS.—The dissociation theory of electrolytes, galvanic cells, conductivity of gases and radioactivity. Lectures and recitations. Two hours per week. First term, Senior year.

467. ELECTRICAL MEASUREMENTS.—Conductivity of electrolytes, E.M.F. of cells, currents through gases and radioactive meas-

urements. Two 2-hour laboratory periods per week. First term, Senior year.

468. PHYSICAL OPTICS.—Interference, dispersion and radiations theories, with applications to optical instruments. Lectures and recitations. Two hours per week. Second term, Senior year.

469. OPTICAL MEASUREMENTS.—The spectrometer, gratings, interferometers, polarimeters and pyrometers. Two 2-hour laboratory periods per week. Second term, Senior year.

470. MOLECULAR PHYSICS AND HEAT.—Physics of the atoms and molecules. Lectures and recitations. Two hours per week. Third term, Senior year.

471. MOLECULAR MEASUREMENTS.—Measurements in heat, determinations of molecular weights, velocities of reactions, etc. Two 2-hour laboratory periods per week. Third term, Senior year.

Courses 472–474 are required of all technical and chemical students during their Sophomore year.

472. ELEMENTARY MECHANICS.—Two lectures, two recitations and two 2-hour laboratory periods per week. First term, Sophomore year.

473. HEAT, ELECTRICITY AND MAGNETISM.—Two lectures, two recitations and two 2-hour laboratory periods per week. Second term, Sophomore year.

474. ELECTRICITY, MAGNETISM, SOUND AND LIGHT. Two lectures, two recitations and two 2-hour laboratory periods per week. Third term, Sophomore year.

Courses 475–477 are required of Electrical Engineering students.

475. ELECTRICAL MEASUREMENTS.—Elementary electrical measurements. Two periods per week. First term, Sophomore year.

476. ELECTRICAL MEASUREMENTS.—Bridge tests, inductance, capacity, the potentiometer and photometry. Two periods per week. Second term, Sophomore year.

477. DIRECT CURRENT ENGINEERING.—D. C. dynamos and motors, switches and circuit breakers, wiring, etc. Two recitations per week. Third term, Sophomore year.

MINERALOGY AND GEOLOGY.

Professor Peck and Mr. Fretz.

The course in Geology is continuous and each term's work depends upon that which has preceded. It is desirable that students electing this subject should do so for at least two terms and that they should be familiar with the elements of Physics, Chemistry and Biology. For the work of the Senior year, a knowledge of these subjects is required.

491. DYNAMICAL, STRUCTURAL AND PHYSIOGRAPHICAL GEOLOGY.—Text-book and illustrated lectures. Elective. First term, Junior year. Two periods per week.

492. HISTORICAL GEOLOGY.—Preparation: **491.** Stratigraphic sequence of rocks, and fossil forms. Elective. Second term, Junior year. Two periods per week.

493. CRYSTALLOGRAPHY.—Preparation: **492.** Crystal forms, properties of crystalline substances, drawing and measurements of crystals. Elective. Third term, Junior year. Two periods per week.

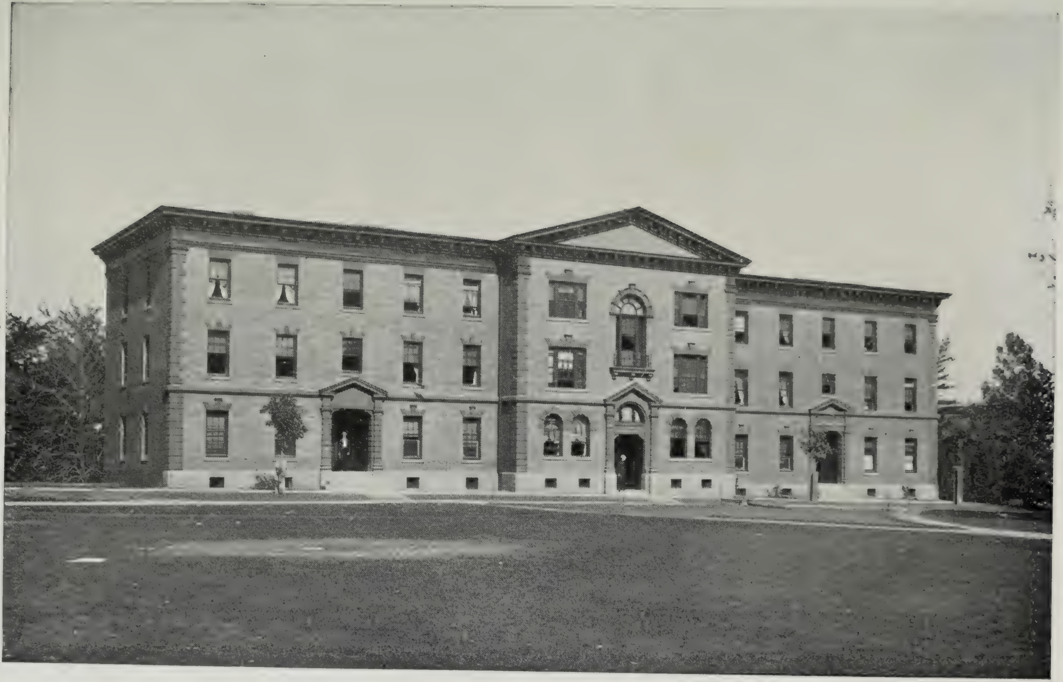
494. PRACTICAL FIELD GEOLOGY.—Preparation: **493.** Elective. First term, Senior year. Two periods per week.

495. ADVANCED CRYSTALLOGRAPHY AND ELEMENTARY PETROGRAPHY.—Preparation: **494.** Elective. Second term, Senior year. Two periods per week.

496. FIELD GEOLOGY.—Preparation: **495.** Elective. Third term, Senior year. Two periods per week.

511. CRYSTALLOGRAPHY.—This course is illustrated with glass and wooden models, and each alternate exercise consists of a practicum at which well-crystallized minerals are studied, and their properties discussed. The latter part of the term is devoted to a brief discussion of the optics of crystals. Text-book—Williams' Elements of Crystallography. First term, Junior year. Two periods per week.

512. PETROGRAPHY.—A large collection of hand specimens of



MARTIEN, FAYERWEATHER AND POWELL HALLS.

rocks with thin sections is used in this study. Text-book—Kemp's Handbook of Rocks and Frulay's Igneous Rocks. Second term, Junior year. Two periods per week. Third term, Senior year. Two periods per week.

513. MINERALOGY.—A systematic review of mineral species, more special attention being paid to their chemical and crystallographic relations and to their mode of occurrence in nature. Instruction is given by lectures which are illustrated by a study collection consisting of some two thousand specimens, including the most important species. A course in determinative mineralogy supplements these lectures. The student is required to determine sixty minerals and to write out a description of each. Third term, Junior year. Three periods per week.

516. GENERAL GEOLOGY.—Dynamical, Structural and Physiographical Geology. The work of the class-room is supplemented by excursions into the neighboring region, and sufficient time is devoted to field work to enable each student to construct a ten-mile section up and down the Delaware River at Easton. Text-book—Scott's Introduction of Geology. First term, Senior year. Two periods per week.

517. GENERAL GEOLOGY.—Continuation of Course **516.** Historical Geology. Accumulations, organic and inorganic, which are of economic importance. Text-book—Scott's Introduction to Geology. Second term, Senior year. Two periods per week.

521. MINING GEOLOGY. ECONOMIC GEOLOGY.—Practical geology of the metalliferous deposits. This is a lecture course, but reading is assigned in the following works: "Economic Geology of the United States," Ries; "Ore Deposits of the United States and Canada," Kemp; "The Nature of Ore Deposits," Beck; etc. Second term, Senior year. Two periods per week.

522. MINING GEOLOGY. FIELD GEOLOGY.—In this course the student makes a detailed study of an area, from which he constructs a colored geological map and geological sections. Specimens of the different rocks and ores are collected and thin sections are cut for microscopical examination. Third term, Senior year. Two periods per week.

523. Mining Geology.—Elective. First term, Senior year. Two periods per week.

524. Mining Geology.—Elective. Second term, Senior year. Two periods per week.

ASTRONOMY.

Professor Hardy and Mr. Cawley.

531. Descriptive Astronomy.—Fundamental definitions of the celestial sphere, parallax, refraction, the earth as an astronomical body, the sun, the moon eclipses and the planets. Text-book—Young's Astronomy. First term, Senior year. Two periods per week.

536. Descriptive Astronomy.—More detailed course than 531. First term, Senior year. Four periods per week.

541–42. Practical Astronomy.—The use of the sextant in determining time by a single altitude of the sun, by a single altitude of a star, by equal altitudes of the sun, by equal altitudes of a star; in determining latitude by the meridian altitude of a star in any position and by circummeridian altitudes. The instrument constants of the transit instrument and its use in determining longitude. The use of the zenith telescope in determining latitude. The sections of the class are made so small that each student gets considerable practice with the instruments. Second and third terms, Senior year. Two periods per week.

543. Astronomy for Engineers.—The work includes a brief introductory course in general Astronomy. This is followed by direct observations on the sun and polaris to determine latitude and azimuth. Azimuthis also found by means of the Burt and Saegmuller solar attachments. The students are trained to find latitude and time by means of the sextant. Third term, Junior year. Two periods per week.

BIOLOGY.

Professor Davison and Mr. Foster.

The work of this Department occupies all of the ten rooms in Jenks Biological Hall. A general laboratory, forty by sixty feet, and four special laboratories well equipped with modern apparatus, in addition to an herbarium and vivarium provide ample facilities for pursuing practical studies on plant and animal life.

The courses in Biology, excepting Sanitary Biology required for the Civil Engineers and Chemists, are elective only, and consist of work throughout the Junior and Senior years. They are open for election to Classical, Latin Scientific, and General Scientific students. In order to meet the double purpose of a professional preparation and general culture, the courses are so arranged as to provide in each the special knowledge required without sacrificing the ends of general culture and discipline which is sought in all the undergraduate courses. Those not wishing to take the complete course, and yet desiring to know the meaning of the life forms, the relation of plants and animals to one another and especially to man, and to understand the factors and methods of evolution, should pursue the work of the last two terms of the Junior year and the first term of the Senior year. One may, however, begin his biological studies at any time prior to the second term of the Senior year. The work of the second and third terms of the Senior year is designed for those expecting to enter the professions of teaching or medicine.

551. MAMMALIAN ANATOMY.—This enables the student to secure a definite idea of the structures of his own body, to understand some of the evidences of evolution of animals and realize the unity of structure of the animal kingdom. A discussion of parts of the cat or dog together with studies and deomonstrations on certain dissected mammals with special reference to the nervous system makes an excellent preparation for the

study of Psychology and Physiology. Elective. First term, Junior year. Two periods per week.

552. VERTEBRATE ZOÖLOGY.—The laboratory work involves a study of one or more types representing each of the five classes of vertebrates. The evolution of the various organs and systems and the origin and development of certain forms of animals together with their habits and natural history furnish fertile topics for recitations and lectures. This course, in connection with General Biology, Course 553, gives the student a general survey of the entire animal kingdom. Elective. Second term, Junior year. Four periods per week.

553. GENERAL BIOLOGY.—The morphology and life history of a few types of the invertebrates are studied with a view to understanding the processes of life and the relation of one form of life to another. Darwinism and the allied problems struggle for existence, parasitism, etc., are discussed, and considerable attention is given to the interdependence of animals and plants, and insects and birds. A well-equipped laboratory with microscopes, aquaria and terraria, offering access to numerous specimens living and preserved, furnishes every advantage to those pursuing this course. Elective. Third term, Junior year. Four periods per week.

554. BACTERIOLOGY AND HEALTH.—Preparation: 551, 553 or 571. This work occupies four periods per week during the first term of the Senior year. A considerable amount of laboratory work, supplemented by investigations in a well-equipped library, and by lectures and demonstrations, is applied to a study of the form, habits and use of bacteria, their relation to agriculture, to industrial processes and to disease. Incubators, water-baths, sand and domestic filters, and microscopes equipped with oil immersion lenses enable the students to make a practical study of the cause and prevention of disease, including disinfection, disposal of sewage, sanitary analysis of water and milk. The necessity and method of ventilation and natural and artificial immunity are treated in the light of the twentieth century knowledge. Elective. First term, Senior year. Four periods per week.

555. Physiology.—Preparation: 551, 553 or 554. The laboratory work consists of the performance of certain experiments and a microscopic study of the chief organs in man. The recitations and lectures are devoted chiefly to the physiological problems relating to the digestive, vascular, respiratory, excretory and nervous systems. Elective. Second term, Senior year. Four periods per week.

556. Embryology and Eugenics.—Preparation: 551 or 552 and 555. The maturation and fertilization of the egg of Ascaris, the segmentation of the egg and the formation of the germinal layers in fish and amphibians, and the origin and early development of the chief organs in chick embryos, and the derivation and function of the fetal membranes in birds and mammals constitute the laboratory work. Either Course II or III, and Course VI are required as a preparation for this course. Elective. Third term, Senior year. Four periods per week.

561. Sanitary Biology.—The cause and prevention of disease, the role of bacteria in the septic tank; the effect of polluted water on health; biological analysis of water. The Biological Laboratory is used by students in this course prior to their work in Water Supply and Sewerage. It contains equipment fitted for the study of Sanitary Biology, *viz.*, twenty compound microscopes, a dozen aquaria, several sets of Sedgwick-Rafter apparatus, modern sand and house filters, drying ovens, sterilizers, incubators, fermentation tubes, petri dishes, etc., furnishing the necessary facilities for a practical study of the algae, aquatic animals and bacteria relating to sewage disposal and water supply. Required for Civil Engineers and Chemists. Elective for others. Third term, Junior year. Two periods per week.

571. Botany.—The time is largely devoted to the study of the morphology and life history of the lower plants from bacteria to ferns and an explanation of the physiological processes in plants. The relation of insects to plants and plants to man, together with the problem of breeding new varieties, are some of the practical topics considered. Excellent advantages for pursuing this branch are offered by the well-equipped labora-

tory and extensive College Herbarium containing representatives of nearly all the mosses, ferns and flowering plants in Pennsylvania in addition to hundreds of species from other regions of North America. Elective. First term, Junior year. Two periods per week.

HYGIENE.

Professor Davison.

580. Lectures on Health and the general principles of Physiology illustrated with Stereopticon views, charts, and other apparatus. First term, Freshman year. One period per week.

PHYSICAL CULTURE.

Mr. Bruce.

581. PHYSICAL CULTURE.—The work of this department is carried on in the gymnasium, and physical training is required of all students of the Freshman Class, four periods per week.

SYSTEM.

The course in physical training embraces educational gymnastics, systematic bodily exercises based on scientific principles and founded on physiological rules.

ANTHROPOMETRY AND PHYSICAL DIAGNOSIS.

The student before entering on the course must present himself to the Director for a physical examination. By means of this examination the physical condition of the individual is ascertained. The relative proportions of the parts of the body; the undue development of some muscles and the relaxed and enfeebled condition of others; the comparative size of body and limbs; variations of height, breadth, weight, and muscular strength from the normal standard of a given age are all taken into account in prescribing the course of training. The results of this examination are plotted on anthropometric charts and directions given in booklet form for developing the various parts of the body and correcting individual defects.

At the end of the course a second examination is made and the results plotted on the same chart, thus showing the student his exact physical improvement.

OPTIONAL COURSES.

Optional courses are offered to upper classmen in advanced gymnastics and instruction in the science of fencing and of wrestling.

In connection with this course a series of in-door games are introduced. The gymnasium is equipped with regulation handball courts and a series of tournaments are held during the second term.

Outdoor exercise is encouraged and cross-country running in a mild form is promoted for the benefit of students who are not members of athletic teams.

CIVIL ENGINEERING.

Professors Porter and Lyle and Messrs. Spengler, Lohr, Williams and Van Buskirk.

601. SURVEYING.—Theory relating to the construction and use of instruments. Field problems in the manipulation and use of the chain, compass, transit and level. Area Computations. Drafting. Text-book—Breed and Hosmer's Plane Surveying. Third term, Freshman year. Two periods per week.

602. SUMMER SCHOOL.—Recitations and lectures on Surveying Methods. Adjustments of Instruments. Profile Leveling. Survey of the College Campus. Map. Three weeks in vacation at end of Freshman year.

603. SURVEYING.—Stadia Survey of a portion of the College Campus. Map. Locating contours and cross sectioning with Hand Level. Completion of Summer School Map. Contour Problems. Text-book—Breed and Hosmer's Plane Surveying. First term, Sophomore year. Two periods per week.

604. HIGHER SURVEYING.—Theory of trigonometric and barometric leveling, plane table, aneroid, precise leveling and base line measurements. Hydrographic and photographic surveying. Field work involving use of plane table and aneroid, Text-book—Breed and Hosmer's Higher Surveying. First term, Senior year. Two periods per week.

611. RAILROADS.—Simple, reverse, compound and vertical curves. Problems. Drafting. Text-book—Allen's Railroad Curves and Earthwork. Second term, Sophomore year. Two periods per week.

612. RAILROADS.—Turnouts, Cross-overs, and Transition Curves. Field problems. Paper location of a railroad. Estimate of cost. Drafting. Text-book—Allen's Railroad Curves and Earthwork. Third term, Sophomore year. Two periods per week.

613. SUMMER SCHOOL.—Railroad reconnaissance. Preliminary and final location. Cross sectioning. Slope staking. Map. Three weeks in vacation at end of Sophomore year.

614. RAILROADS.—Methods of computing earthwork. Construction and use of tables and diagrams. Problems. Completion of Summer School Map. Computation of earthwork from notes of Summer School Survey. Profile. Mass diagram. Text-book—Allen's Railroad Curves and Earthwork. First term, Junior year. Three periods per week.

615. RAILROADS.—Economic location. Traffic. Operating expenses. Cars and locomotives. Railroad structures. Problems. Text-book—Webb's Railroad Construction. Second term, Junior year. Two periods per week.

621. APPLIED MECHANICS.—Statics. Forces, equivalence of force systems, centroids, general principles of equilibrium and application of the principles of equilibrium. Text-book—Maurer's Technical Mechanics, Part I. Third term, Sophomore year. Four periods per week.

622. APPLIED MECHANICS.—Kinematics.—Rectilinear and curvilinear motion, motion of a rigid body. Kinetics.—Motion of a particle, and of a system of particles, translation of a rigid body, rotation, work and energy. Text-book—Maurer's Technical Mechanics, Part II. First term, Junior year. Four periods per week.

623. MECHANICS OF MATERIALS.—The principles of stress and strain; the behavior of materials under tension, compression

and shearing; investigation and design of pipes, riveted joints, boilers and standpipes; strength and flexure of simple and cantilever beams. Report on the carrying capacity of a floor. Text-book—Merriman's Mechanics of Materials. First term, Junior year. Four periods per week.

624. MECHANICS OF MATERIALS.—Restrained and continuous beams; columns; shafts; reinforced concrete. Impact and fatigue; true and internal stresses; mathematical theory of elasticity. Design of an I-beam highway bridge and of a steel standpipe. Text-book—Merriman's Mechanics of Materials. Second term, Junior year. Four periods per week.

625. GENERAL TESTING LABORATORY.—Study and use of testing machines. Commercial tension tests of iron and steel. Modulus of elasticity in tension and compression. Shear tests of iron, steel and wood. First term, Junior year. Two periods per week.

626. GENERAL TESTING LABORATORY.—Transverse tests of cast iron and wood; modulus of elasticity of steel in bending; tests of wooden columns; torsion tests of iron and steel; calibration of testing machines; modulus of elasticity of concrete; reinforced concrete beams. Second term, Junior year. Two periods per week.

631. ROADS AND PAVEMENTS.—Location, construction and maintenance of town and country roads, city streets and pavements. Street cleaning. Text-book—Baker's Roads and Pavements. Second term, Junior year. Two periods per week.

632. ROAD MATERIAL LABORATORY.—Standard tests of paving brick and road metal. Second term, Junior year. One period per week.

641. MASONRY.—Classification and properties of stone, building brick, common and hydraulic lime, sand, gravel and broken stone. Stone-cutting, stone and brick masonry. Ordinary and pile foundations. Foundations under water. Retaining walls, bridge abutments, bridge piers and culverts. See also courses 652 and 642. Text-book—Baker's Masonry. Third term, Junior year. Two periods per week.

642. MASONRY DESIGN.—Design of a high masonry dam and masonry arch, using both graphical and numerical processes. Notes. First term, Senior year. Two periods per week.

651. CEMENT.—The study of composition and method of manufacture of cement. Interpretation and method of performing different physical tests. Inspection and sampling of cement. Visit to cement mills. Standard methods of testing and specifications for cement. Text-book—Taylor's Practical Cement Testing. First term, Junior year. Two periods per week.

652. CONCRETE, PLAIN.—Materials, laws of proportioning, forms for concrete, making and placing of concrete, strength, weight, and cost, concrete building blocks and artificial stone. See also Course 641. Text-book—Baker's Masonry. Second term, Junior year. Two periods per week.

653. CONCRETE, REINFORCED.—Properties of material, contraction and expansion, fireproofing, steel requirements, concrete and steel in combination. The theory and design of slabs, beams, and columns. Text-book—Hool's Reinforced Concrete Construction, Vol. 1. Third term, Junior year. Two periods per week.

654. CEMENT LABORATORY.—Routine tests of Portland cements are made in accordance with the standard methods and specifications, the aim being to have the student become thoroughly acquainted with each standard test and to appreciate the significance of the results obtained. Special tests are also assigned to each student. Notes. First term, Junior year. Two periods per week.

655. CONCRETE LABORATORY.—Mechanical analysis of the materials for concrete. Proportioning and mixing, preparation of plain and reinforced concrete specimens for future tests. Notes. Second term, Junior year. Two periods per week.

656. REINFORCED CONCRETE LABORATORY.—Tests on plain concrete specimens to determine the stress deformation curve in tension and compression. Modulus of elasticity. Tests on reinforced beams to determine deflection and fiber stress distribution, location of neutral axis, and comparison of actual

results with those given by various formulas. Third term, Junior year. Two periods per week.

661. HYDRAULICS.—Hydrostatics, hydraulic instruments, orifices, weirs and tubes. Text-book—Merriman's Hydraulics. Third term, Junior year. Three periods per week.

662. HYDRAULICS.—Pipes, conduits; rivers; water power; dynamics; overshot, undershot and breast wheels; impulse wheels; turbines. Text-book—Merriman's Hydraulics. First term, Senior year. Three periods per week.

663. HYDRAULIC LABORATORY.—Tests are made on the circular orifice, the Venturi meter, water meters and weirs. Third term, Junior year. One period per week.

664. HYDRAULIC FIELD WORK.—Measurements of the flow of a stream by use of the current meter. Notes. First term, Senior year. Two afternoons.

671. SEWERAGE.—The disposal of sewage and garbage. The determination of the size and capacity of sewers, inlets and flush tanks. Construction methods. Text-book—Folwell's Sewerage. First term, Senior year. Two periods per week.

672. SEWERAGE DESIGN.—Design of a sewer system for a small city with map and profiles. Notes. Second term, Senior year. Two periods per week.

681. WATER SUPPLY.—The requisites for a good water; the available sources of supply; the construction of pumping plants, reservoirs and pipe lines; purification of water and its distribution to the public. Text-book—Turneaure and Russell's Public Water Supplies. Second term, Senior year. Three periods per week.

682. WATER SUPPLY DESIGN.—Design of a water-supply system for a small city. Notes. Third term, Senior year. Two periods per week.

683. PARK ENGINEERING.—Lectures on the engineering work involved in park and parkway development. Preliminary surveys; the acquisition of lands; topographical surveys for the use of the landscape architect; the letting of contracts; the preliminary operations of the contractor; drainage and

sewerage; grading by hand, excavator, dredge and steam-shovel; pile driving; masonry walls and steps; water-supply systems; paths and drives; lighting. Second term, Senior year. One period per week.

690. FRAMED STRUCTURES.—The theory and computation of stresses in simple roof and bridge trusses and towers, under dead, live and wind loads. Notes. Third term, Junior year. Two periods per week.

691. ROOFS AND BRIDGES.—The theory and computation of stresses in simple roof and bridge trusses and towers, under dead, live and wind loads. Railroad bridges under locomotive wheel, excess and equivalent loads. Stress sheets. Notes. First term, Senior year. Two periods per week.

692. ROOFS AND BRIDGES.—The theory and computation of stresses in continuous, partially continuous, draw and cantilever trusses. Notes. Second term, Senior year. Six periods per week.

693. ROOFS AND BRIDGES.—The theory and computation of stresses in suspension bridges and three-hinged arches. Notes. Third term, Senior year. Five periods per week.

694. ROOF DESIGN.—Complete computations and design drawing for a wooden roof truss with bill of materials and cost sheet. Notes. First term, Senior year. One period per week.

695. BRIDGE DESIGN.—Complete computations and design drawing of a plate girder for railroad purposes, in accordance with standard specifications. Bill of materials, weights and estimate of cost. Notes. Second term, Senior year. Two periods per week.

696. BRIDGE DESIGN.—Complete computations and design drawing of a through pin-connected railroad bridge in accordance with standard specifications. Bill of materials, weights and estimate of cost. Notes. Third term, Senior year. Five periods per week.

697. BRIDGE ERECTION.—Designing of false work. Erection of a full-weight pin-connected truss bridge. Third term, Senior year. Two days.

698. Graphic Statics.—Analysis of stresses by the force and equilibrium polygon, applications to the discussion of beams and girders. Analysis of stresses in roof and bridge trusses. Notes. First term, Senior year. One period per week.

699. Thesis.—A thesis is required of every student as a condition of graduation, upon a subject appropriate to and approved by the Department. All laboratories and other apparatus belonging to the Department may be used for thesis purposes. Third term, Senior year. Two periods per week.

MINING ENGINEERING.

Professor Marquard and Mr. Hatch.

701. Mine Surveying.—Instruments. Stations. Underground traversing. Method of connecting surface and underground surveys. Use of top, side and solar telescopes. Mapping. Mineral land claims. Problems. Second term, Junior year. Two periods per week.

706. Prospecting.—Physical characteristics of deposits. Geological indications. Prospecting for placer, vein and bedded deposits. Preliminary workings. Sampling. Examination. Valuation. Location of mineral claims. Second term, Junior year. Two periods per week.

711. Deep Boring.—Use and location of bore holes. Rod boring. American system of cable drilling. Diamond drilling. Davis-Calyx, Matther-Platt, and Kind's systems of drilling. Survey of bore holes. Shaft sinking by boring. Third term, Junior year. One period per week.

716. Blasting and Quarrying.—Explosives. Black powder, nitroglycerine, and its compounds; other high explosives and their use. Tools for boring blast holes, and the amount of charge. Firing by squib, and electricity. Slate, cement and stone quarrying. Third term, Junior year. One period per week.

721. Shaft Sinking, Drifting, Tunneling.—Shaft excavation and timbering. Location. Alignment. Level stations in the shaft. Special sinking methods; piling drums, freezing pro-

cess, Triger's method, Kind-Cauldron system. Lippman's system. Tunneling methods in hard and soft rock. Systems of tunneling. First term, Senior year. Two periods per week.

726. EXPLOITATION.—Open cut work. Hydraulic mining. Gold dredging. Coal mining methods. Metal mining methods. Stoping methods. Slicing, caving, filling, block caving, room and pillar methods of mining ore. Methods of mine development. Maps to illustrate. Salt mining. First term, Senior year. Two periods per week.

731. TRANSPORTATION.—Arrangements for loading and unloading cars and bins on surface and underground. Underground haulage: animal, electric, rope, steam, and air. Self-acting planes. Hoisting drums, brakes, motors, ropes, guides. Safety appliances. Signals. Second term, Senior year. Two periods per week.

736. VENTILATION AND LIGHTING.—Air in mines. Mine gases. Testing air. Analysis of mine gases. Natural, furnace ventilation. Positive blowers. Centrifugal fans. Theory and efficiency of fans. Measurement and control of air currents. Resistance of air ways. Explosions. Laws. Method of lighting. Safety lamps, electric lights. Laws. Second term, Senior year. Three periods per week.

741. MINE DRAINAGE.—Source and action of mine waters. Mine pumps. Water column pipes. Dams. Hoisting buckets. Drainage tunnels. Siphons. Operation of pumps by electricity and compressed air. Theory and efficiency of centrifugal pumps. Third term, Senior or Junior year. Three periods per week.

746. MINE CONSTRUCTION.—Study of stresses in beams, columns and girders by graphic statics. Design of a mine gangway set. Shaft timbering. Square set timbering methods. Design of flumes and trestles. First term, Senior year. Two periods per week.

747. MINE CONSTRUCTION.—Masonry, foundations, retaining walls. Stresses in trusses by graphic statics. Design of a roof truss. Second term, Senior year. Two periods per week.

748. MINE CONSTRUCTION.—Design of ore bins, head frame, tipples, and mill buildings. Third term, Senior year. Two periods per week.

751. ORE DRESSING.—Hand picking. Principle of crushing, and concentration. Crushers: jaw and gyratory, rolls, stamps, Huntington mill, Chilean mill, arastras. Classifying machinery: trommels, grizzlies, shaking screens, hydraulic classifiers, settling ponds, spitzkastens. Concentrating machinery: jigs with theory of jigging, vanners, tables, magnetic concentrators, amalgamation. Third term, Senior or Junior year. Four periods per week.

756. MINE MACHINERY.—Coal cutters, drills, hoists, cableways, motors, blast firers, air compressors. Theory of air compression and method of using and conducting compressed air. Second term, Senior year. Two periods per week.

761. MINE ADMINISTRATION.—Organization, administration and management. Mine accounts and cost keeping. Third term, Senior year. Two periods per week.

766. MINING LAW.—Review of the mining laws of the various countries. General principles of real estate law with respect to minerals. United States mining laws. State laws and local regulations. Third term, Senior or Junior year. Two periods per week.

771. THESIS.—A graduating thesis is required of each candidate for a degree. This thesis must be an original design or review of some process, machinery or plant related to mining operations. The subject of the thesis is assigned by the department along lines of special interest to the student.

ELECTRICAL ENGINEERING.

Professors Rood and Lewis.

804. ELEMENTS OF ELECTRICAL ENGINEERING.—A special course designed for students in Civil, Mechanical and Mining Engineering. Elective for General Scientific and Latin Scientific students. Electricity and magnetism; electrical measurements; electrical illuminants; lighting systems; dynamos;

motors; alternating current machinery; transformers. First term, Junior year. Three periods per week.

806. Electrical Problems.—Solution of elementary problems relating to direct current engineering. First term. Junior year. Two periods per week.

807. Electrical Problems.—A continuation of **806.** Solution of problems relating to more advanced direct current engineering and to elementary alternating current engineering. Second term, Junior year. Two periods per week.

811. Alternating Currents.—Fundamental principles governing circuits having a variable E.M.F.; effect of resistance, inductance and capacity; generalized Ohm's law. First term, Junior year. Three periods per week.

812. Alternating Currents.—A continuation of **811.** Alternator regulation; single, two- and three-phase circuits; measurement of power in polyphase circuits; theory of the transformer, single and polyphase transformers; methods of phase transformation. Second term, Junior year. Three periods per week.

821. Electrical Laboratory.—Introduction to Laboratory methods and practice; measurements of resistance by drop method; insulation test; magnetic leakage; fuses; voltmeter and ammeter calibration by various methods; recording meters. First term, Junior year. Two periods per week, reports.

822. Electrical Laboratory.—A continuation of **821.** Tests upon arc and incandescent lamps; photometry; magnetization and characteristic curves of dynamos; tests of armature reactions. Second term, Junior year. Two periods per week, reports.

823. Electrical Laboratory.—A continuation of **822.** Parallel running of generators; investigation of commutator losses; elementary tests with alternating currents; effects of inductance and capacity. Third term, Junior year. Two periods per week, reports.

824. Electrical Laboratory.—Motor and dynamo characteristics, A. C. wave form; magnetization and characteristic curves of alternating current generators, efficiency and regulation tests of transformers. First term, Senior year. Two periods per week, reports.

825. Electrical Laboratory.—A continuation of 824. Tests of induction and synchronous motors; transformer groupings and resultant ratios; phase transformation; power transmission; transmission losses and efficiencies. Second term, Senior year. Two periods per week, reports.

826. Electrical Laboratory.—A continuation of 825. Motor-generator tests; investigation of the rotary converter and its losses and characteristics; dielectric strength of insulating materials; resonance; the oscillograph. Third term, Senior year. Two periods per week, reports.

827. Electrical Laboratory.—A special laboratory course designed for students in Civil, Mechanical and Mining Engineering. Elective for General Scientific and Latin Scientific students. Fundamental experiments in calibrations, photometry, direct current generator characteristics. Second term, Junior year. Two periods per week.

828. Electrical Laboratory.—A continuation of 827. Motor characteristics, motor and dynamo efficiencies, alternating current motor and transformer tests. Third term, Junior year. Two periods per week.

831. Engineering Abstracts.—The review and discussion of articles and papers of value in current engineering literature. Throughout Junior and Senior years. One period per week.

841. Electrical Design.—The design and calculation of rheostats, controllers, wiring systems and machines. First term, Senior year. Two periods per week.

842. Electrical Design.—A continuation of 851. Design and calculation of advanced types of electrical machinery, generators, motors and transformers. Second term, Senior year. Two periods per week.

851. Motor Engineering.—A detailed consideration and comparison of the various types of constant and multi-speed direct and alternating current motors, their control, proper fields of use; types and methods of machine drives; power require-

ments of various commercial processes. Second term, Junior year. Three periods per week.

852. ILLUMINATING ENGINEERING.—A review and close study of the modern type of illuminants, gas and electric; photometry and standards of light; candle power distribution; effective illumination; reflectors, shades and globes, their effects and losses; location of lights; wall reflection and absorption. Third term, Junior year. Three periods per week.

853. ELECTRIC RAILROADS.—Systems of distribution; rail-bonds and bond testing; electrolysis; direct current motors and controllers; single-phase commutator motors, train operation and control, speed-time curves. Third term, Senior year. Five periods per week.

861. ELECTRIC POWER TRANSMISSION.—Low potential direct and alternating current distributing systems; calculation of losses and drop; house and factory wiring and systems; fire hazards and their prevention; high potential lines, their construction and maintenance; lines and line losses. First term, Senior year. Four periods per week.

871. ELECTRIC POWER STATIONS. A study of the considerations affecting the selection, erection and maintenance of steam and electric power plant machinery, and the assembling of such a machinery to form an economical plant for the production of electric power and light. Second term, Senior year. Three periods per week.

872. HYDRO-ELECTRIC ENGINEERING.—The fundamental principles of hydroelectric engineering; types, and forms of powerhouses; the types, proper selection and erection of turbines and governors, generating, switching and transmission apparatus. Third term, Senior year. Four periods per week.

881. THE TELEPHONE.—A study of all the modern telephone systems with a review of the earlier systems and development. Third term, Senior year. Five periods per week.

891. THESIS.—A thesis is required of every student as a condition for graduation, the topic assigned or approved by the head of the Department. The thesis must show the result of individual investigation and research.

CHEMISTRY AND METALLURGY.

Professors Hart and Wysor and Messrs. DeLong, Ross and Garretson.

901. ELEMENTARY DESCRIPTIVE INORGANIC CHEMISTRY.—Brief course in the chemistry of the non-metals and metals comprising lectures, preparatory work, and recitations. Third term, Sophomore year. Two periods per week.

902–3–4. QUALITATIVE ANALYSIS AND QUANTITATIVE ANALYSIS (Begun).—First, second and third terms, Junior or Senior year. Two periods per week.

905–6–7. QUANTITATIVE ANALYSIS.—Elective Course: The work of which is varied to meet the requirements of the student. First, second and third terms, Senior year. Two periods per week.

908–9–10. ORGANIC CHEMISTRY.—Elective course. First term laboratory. Second and third terms, laboratory and quiz. First, second and third terms, Senior year.

911. DESCRIPTIVE INORGANIC CHEMISTRY.—Lectures, quizzes and laboratory work. First term, Freshman year. Four periods per week.

912. ADVANCED INORGANIC CHEMISTRY.—The law of gases. The chemical balance. Diffusion and dissociation. Principles of quantitative analysis. Recitations and laboratory work. Second term, Freshman year. Two periods per week.

913. QUALITATIVE ANALYSIS (Begun).—Third term, Freshman year. Two periods per week.

914. QUALITATIVE ANALYSIS (Continued).—First term, Sophomore year. Six periods per week.

915. QUALITATIVE ANALYSIS (Completed).—Second term, Sophomore year. Six periods per week.

916. QUANTITATIVE ANALYSIS (Begun).—Third term, Sophomore year. Six periods per week.

917. CHEMICAL ARITHMETIC.—Third term, Sophomore year. Three periods per week.

918. QUANTITATIVE ANALYSIS (Continued).—First term, Junior year. Five periods per week.

919. THEORETICAL CHEMISTRY including special determination in the laboratory. First term, Junior year. Two periods per week.

920. ORGANIC CHEMISTRY (Begun).—Laboratory work. First term, Junior year. Four periods per week.

921. ORGANIC CHEMISTRY (Continued).—Lectures, recitations and laboratory work. Second term, Junior year. Four periods per week.

922. ORGANIC CHEMISTRY (Completed).—Third term, Junior year. Four hours per week.

924. THEORETICAL CHEMISTRY (Continued).—Second term, Junior year. Two periods per week.

925. THEORETICAL CHEMISTRY (Completed).—Third term, Junior year. Two periods per week.

926. QUALITATIVE ANALYSIS (Begun) (Shorter Course).—Second term, Freshman year. Two periods per week.

927. QUALITATIVE ANALYSIS (Completed) (Shorter Course).—Third term, Freshman year. Two periods per week.

928. QUALITATIVE ANALYSIS (Advanced Course).—First term, Sophomore year. Two periods per week.

929. QUALITATIVE ANALYSIS (Continued) (Advanced Course).—Second term, Sophomore year. Two periods per week.

930. QUANTITATIVE ANALYSIS (Begun) (Shorter Course).—Third term, Sophomore year. Two periods per week.

931. QUANTITATIVE ANALYSIS (Continued).—Second term, Junior year. Five periods per week.

932. QUANTITATIVE ANALYSIS (Continued).—Third term, Junior year. Four periods per week.

933. QUANTITATIVE ANALYSIS (Continued).—First term, Senior year.. Ten periods per week.

934. CHEMICAL ENGINEERING.—The Elements of Chemical Engineering. First term, Senior year. Two periods per week.

935. CHEMICAL TECHNOLOGY.—Manufacture of "heavy chemicals." Second term, Senior year. Two periods per week.

951. METALLURGY.—Properties of Metals. Refractory materials and fluxes; furnaces; fuels and thermo measurements; ore dressing; iron and steel. First term, Junior year. Two periods per week.

952. METALLURGY.—Lectures, recitation and laboratory. Second term, Junior year. Two periods per week.

953. METALLURGICAL CHEMISTRY.—Elective. First term, Senior year. Two periods per week.

954. METALLURGICAL CHEMISTRY (Continued).—Elective. Second term, Senior year. Two periods per week.

955. ASSAYING.—Second term, Senior year. Two periods per week.

961–2–3. TECHNICAL GERMAN.—Translation of Chemical works from the German. First, second and third terms, Junior year. One period per week.

964–5–6. TECHNICAL GERMAN (Continued).—First, second and third terms, Senior year. One period per week.

971. THESIS WORK.—Second term, Senior year. Four periods per week.

972. THESIS WORK (Completed).—Third term, Senior year. Twelve periods per week.

973. AGRICULTURAL CHEMISTRY (optional).—Second term, Senior year. One period per week.

974. LEAD BURNING (optional).—Second term, Senior year. One period per week.

MECHANICAL ENGINEERING.

Professor Fitch and Messrs. Haslam, Pearce, Wasser, Wallaesa and Logan.

1001. SHOP WORK.—The Civil Engineers, Mining Engineers, and Chemists spend the Sophomore year in the shops, two periods per week, the time being divided between the Pattern Shop, Foundry, Machine Shop, and the Forge.

The Mechanical Engineers and the Electrical Engineers spend both the Sophomore and the Junior years in the shops, two periods per week.

PATTERN SHOP.—Use and care of hand tools, study of the materials used, the reading of drawings, the study of the relation of pattern making to molding. Pattern turning between centres and on face plates. Study of solid and hollow castings and the construction of their patterns, including core-prints and core-boxes; study of shrinkage, fillets, draft, finish, reasons for finishing in color, etc. Study of machines used in pattern shops.

FOUNDRY.—Tempering and mixing sands, facing preparations, the use and care of tools and shop equipment, ramming, gating, venting, risers, weighting, and the use of jackets. Duplicate and multiple production. The making, drying, venting, handling, and setting of cores. Sand and plaster matches. Management of the cupola and care of ladles. Exercises in skim gates, shrink heads, stopping off, open sand sweep work, loose piece moulding, and the use of chills. Dry sand and loam are taken up with suitable examples. Castings are first made in white metal for practice, and then in brass or cast iron.

MACHINE SHOP.—Exercises on the lathe, shaper, miller, planer, drill press, and cold saw, enabling the student to become familiar with the use and operation of the various parts of the machines. The advanced student is given repair work such as is necessary in the department.

FORGE, SHEET METAL AND PIPE SHOP.—Exercises in drawing, upsetting, forming, and welding of iron and steel, use of tools such as fullers, swages, sets, etc., tool making, annealing, hardening and tempering of steels, oil tempering, case hardening, brazing, chipping and filing to size. Sheet metal work: use of tools, laying out, forming, soldering, brazing, riveting, making laps, and wiring. Pipe work: use of tools, cutters, tongs, etc., cutting and threading to fit, making joints such as rubber, wire gauze, and asbestos gaskets, and lead joints, to stand test pressures.

1011. MECHANISM.—The study of the motions and forms of mechanisms occurring in machines, also the study of mechanisms found in modern machine tools. The course also includes the design of gear teeth, the theory and practice of designing valve gears and governors for steam engines. Three terms, Sophomore year. Two periods per week.

1012. MACHINE DESIGN.—The designing of simple machines, pumps, cranes, and engines, involving gears, power transmission, cables, chains, etc., and a study of friction and of the action of reciprocation parts. If time permits, the design of a steam or gas power plant may be taken up. (Lecture sand drafting room.) Three terms, Senior year. Three periods per week.

1021. BOILERS.—The study of the various types of steam boilers, and their auxiliaries, and the accessories of a steam plant. Some design work is given in connection with this course in order that the student may become more familiar with the construction and details of steam boilers. First and second term, Junior year. Three periods per week.

1022. TURBINES.—A study and design of the various types of turbines and their auxiliaries, and their application to power problems. Second and third terms, Senior year. Three periods per week.

1023. STEAM ENGINEERING.—Primarily a descriptive course dealing with the selection, adjustment, care and repair of various types of engines, turbines, boilers, pumps, and all accessories. Higher mathematics and theory is reduced to a minimum, for the object of this course is not to teach the design of steam apparatus, but the intelligent operation of same. (Lectures and recitations.) Second term, Junior year. Three periods per week.

1024. THERMODYNAMICS.—The theory of heat, and its applications to engineering. Perfect gases, steam, hot air engines, steam engines, turbines, injectors, refrigerating machines. (Lectures and recitations.) First and second terms, Senior year. Four and three periods per week.

1025. STEAM ENGINES.—A study of the various types of engines with their auxiliaries and their applications. Third term, Junior year. Three periods per week.

1041. GAS ENGINES.—A study of the types of engines, their fuels and accessories, gas producers, etc. Second term, Junior year. Three periods per week.

1051. HEATING AND VENTILATION.—Heating of buildings by hot air—natural draft and forced; hot water, and steam—direct and indirect radiation. Ventilation of buildings. Computations and sketches for assigned problems. (Lectures and recitations.) Third term, Senior year. Four periods per week.

1061. INDUSTRIAL MANAGEMENT.—A study of piece work and flat rates; time and cost keeping; organization of working force, location of factories, production of product; contracts, specifications, etc. (Lectures and recitations.) First term, Senior year. Two periods per week.

1072. THESIS.—A thesis is required of every student as a condition of graduation. The subject may be chosen by the student, but it must be approved by the Department. The shops, laboratories, and all apparatus belonging to the Department may be used for this work. Third term, Senior year. Two periods per week.

BRAINERD HALL.

GENERAL INFORMATION.

ATTENDANCE.

Attendance on all college exercises is strictly required. Absences on account of sickness, or for other satisfactory cause, may be excused, and leave of absence will be granted at the request of parents when absolutely necessary. In such cases the absence is excused, but the student is invariably required to make up such work as he may lose by reason of his absence. Reports are sent to parents whenever the absences of their sons exceed a reasonable number. In case of the absences becoming excessive the faculty will punish the neglect with suspension. Absences incurred at the beginning and end of a term, especially if they involve absence from examinations, and immediately preceding and succeeding holidays, are regarded with special disapproval, and under ordinary cricumstances will not be excused.

Each student is expected to have at least sixteen recitations each week. No student is permitted to take a course involving fewer hours of recitation without a special vote of the Faculty. Three hours of field or laboratory work are regarded as equivalent to one recitation period. The regular gymnasium drills are also regarded as required exercises as far as prescribed.

EXAMINATIONS.

Examinations are held at the close of each term on the studies of that term, and may be either written or oral, or both, at the option of the professor in charge.

In addition to these regular examinations, partial examinations and written recitations are held from time to time during the term, with or without notice to the students. Failure to attend an examination, except for reasons of absolute necessity, is regarded as a serious delinquency, and will be dealt with according to the circumstances of each case.

STANDING.

The scholarship of students is determined by the results of the examinations and daily recitations combined.

Students entering with conditions are required to make them up before the end of the term next after that in which they enter.

Students failing to pass in the studies of any term are required to make up such studies before the beginning of the term after that in which the failure occurred, and they may be specially directed to do so at an earlier date. Students who do not comply with these regulations will be put on probation in scholarship, or lose standing and be only "permitted to recite," or be dropped into the next lower class, as the Faculty may in each case decide.

Reports of the standing of the students are made to their parents or guardians at the end of each term.

RULES GOVERNING ABSENCES AND RE-EXAMINATIONS.

1. No absence from a recitation, a lecture or a laboratory exercise shall be excused.

2. If the number of a student's absences in any term from the exercises in any subject exceed the number of exercises per week in the subject, but not double the number, he may, at the discretion of the instructor in charge, be debarred from the term examination

in the subject, provided the number of absences is not less than three.

If he be debarred, he must pass on the subject before the first day of the next term or repeat the subject with a following class.

3. If the number of a student's absences in any term from any subject exceed double the number of exercises per week in the subject, he shall be debarred from the term examination and must repeat the subject with a following class, provided that the number of such absences must exceed three.

4. If, for special reasons, the head of the department recommend it, the faculty may vote that a student who would otherwise be required to repeat a subject by Rule 3 be given one examination on the subject. If he fails in this examination, he must repeat the subject.

5. Before a student may take the examination provided for in Rule 4, he shall be required to pay to the treasurer of the college a fee of two dollars and show the treasurer's receipt for the same to the teacher in charge of the examination.

6. The instructor in charge of each subject shall, at the beginning of each week, post in some place easily accessible to the students interested, the number of absences from the exercises of the subject of each student to date.

7. All absences shall be reported weekly to the clerk of the faculty, who shall record them.

8. When the number of a student's unexcused and unpermitted absences from the religious and other exercises of the college reaches five, he shall be warned by his class dean; when it reaches ten, he shall be again warned; when it reaches fifteen, he and his parents shall be warned that he is in danger of being dropped from the college rolls; when it reaches twenty, he shall be dropped. If at the end of a term a student has twenty such absences he shall have five absences charged against him on the next term for every five or fraction of five absences above nineteen which stand against him.

PERMITTED ABSENCES.

9. In case of absence due to prolonged sickness or request from home for urgent reasons approved by the dean, the student shall, as soon after the absence as possible, present to the dean a written

statement of the cause of his absence, after which the dean shall give the student an exact statement of the duration of his absence, which he shall present to his instructors, each of whom shall indorse upon it the number of absences from his subject covered by it. The student shall then take it to the dean, and the absences indorsed upon it shall not be counted by the clerk in making up the number of Rule 8.

When such permitted absence causes the number of a student's absences in any subject to reach the number which would debar him from the examination, he shall be required to make up the work done by the class during as many of these absences as are required to bring his absences below the debarring number by an examination to be held within a month of the absences.

If he fail in this examination, he shall be debarred from the term examination and required to pass on the subject by a special examination to be held before the first day of the following term. If he fail in this special examination, he shall repeat the subject with a following class.

Before the special examination may be held, the student shall pay to the treasurer of the college a fee of two dollars, and shall show his receipt for the same to the instructor in charge of the examination.

The student shall be permitted to make up, by examination, all these permitted absences, in which case none of them shall be counted against him.

10. When permission to be absent from town has been given to a student by vote of the faculty or by the President acting for the faculty, such student shall receive from the dean an exact statement of the duration of such absence, which he shall present to his instructors, each of whom shall indorse upon it the number of absences from his subject covered by it. The student shall then return it to the dean and the absences indorsed upon it shall not be counted by the clerk in making up the number of Rule 8.

When such permitted absences shall cause the number of a student's absences in any subject to reach the number which would debar him from the examination, he shall be required to make up the work done during as many of these absences as are necessary to bring his absences below the debarring number by an examination held within a month of the absence.

If he fail in this examination he shall be debarred from the term examination and required to pass on the subject by a special examination to be held before the first day of the following term. If he fail in this special examination, he shall repeat the subject with a following class.

Before this special examination may be held, the student shall pay to the treasurer of the college a fee of two dollars and shall show his receipt for the same to the instructor in charge of the examination.

The student shall be permitted to make up, by examination, all these permitted absences, in which case none of them shall be counted against him.

11. If professors, in whose departments a student has the majority of his hours per week, report to the faculty that the student is neglecting his work, he and his parents shall be warned that he is in danger of being dropped from the college rolls. If a second such report be made, he shall be dropped.

EXAMINATIONS AND RE-EXAMINATIONS.

1. No examination shall be given at any time other than that specified in the Examination Schedules.

2. No Professor or Instructor is authorized to excuse an absence from any examination. The College Dean may issue a permit covering absences from examinations, in which case such absences become permitted absences, and shall not be counted against the student having the same.

3. A student who is absent from any term examination shall be so reported and conditioned in the subject.

4. Absence from any examination shall be counted as an examination, unless the absence is covered by a permit, or the student has been debarred.

5. A student who has not been debarred, having an unpermitted absence from any term examination, shall be entitled to only one examination, for which he shall pay to the College Treasurer a fee of five dollars and present to the Instructor in charge a receipt for the same on or before the date of the examination. An unpermitted

absence from this examination necessitates the student repeating the subject in course or with a delinquent class.

6. A student who fails at the regular term examination in any subject shall be entitled to one re-examination.

7. If, for special reasons, the head of the department recommend it, the faculty may vote that a student who has failed in the re-examination provided for in Rule 1 may be given a second re-examination.

8. Before a student can take the second re-examination provided for in Rule 2, he shall be required to pay to the treasurer of the college a fee of two dollars and show the treasurer's receipt for the same to the instructor in charge of the examination.

9. If, at the beginning of the college year, a student has failed to pass on his conditions of the preceding year in the departments of Mathematics, Mechanics, Physics, French and German, and in Projections and Descriptive Geometry in the department of Graphics, he shall be required to repeat the subjects in which he is still conditioned. "Students in the Chemical Course cannot go on with Chemistry at the beginning of a college year if they are conditioned in Chemistry."

10. When subjects, which closely depend upon each other, are continued throughout successive terms, the department interested may require that all conditions of any terms in those subjects shall be made up within two weeks from the beginning of the next term, in order that the student may go on with those subjects.

11. All students who have one or more conditions in Freshman English at the end of the third term are required to take English with the incoming Freshman class and to remain in the course till they have satisfactorily passed off their conditions. No re-examinations are given in the course.

12. A student who fails in mathematics in any term of the Freshman year or in the first term of the Sophomore year shall report for re-examination at nine o'clock of the day preceding the first day of the next term and if he fails to make up his condition he shall take an extra class of two hours per week for one term in the subject in which he failed, said class to rank as a regular part of his schedule of study.

CONDITIONS.

1. A student who fails to complete satisfactorily the work prescribed in any subject is permitted to continue his studies upon *condition* that he make up the failure, or remove the condition, within a specified time.

2. Where no other time is fixed the condition must be removed before the beginning of the third term after that in which the failure occurred. If the condition is not made up before that time the student shall repeat the subject.

3. A student shall not be enrolled as a member of the Sophomore class who has any entrance conditions unless by vote of the faculty he be permitted to make up his deficiency by taking an equivalent amount of college work, in addition to his regular schedule, in satisfaction of the condition.

4. A student shall not be enrolled as a member of the Junior class who has any Freshman conditions, nor of the Senior class who has any Sophomore conditions, and all subjects prior to Senior year must be made up before the beginning of the second term of the Senior year in order that the student may be a candidate for a degree at Commencement of that year. A student who would otherwise be a candidate for a degree in that year may be permitted by vote of the faculty to remove conditions by repeating the subjects with a class, but not by a special examination.

5. A student who, at the opening of a college year, has overdue conditions representing more than twleve (12) hours of work shall fall back to the next class.

6. A student who, at the opening of a college year, has overdue conditions representing sixteen (16) hours of work, whether he be a regular or a special student, shall be dropped from the college unless he can arrange to enter a lower class as a regular student with conditions aggregating less than eight hours of work.

NOTE:—By "hours of work" is meant the number of exercises scheduled in that subject for one term.

GRADUATION.

Students who have pursued an entire course as prescribed and have successfully passed their examinations are recommended to the trustees for the first academic degree in course. Such recommendations are ordinarily acted upon and the degrees are conferred at Commencement, at which time the students receive diplomas from the President of the College. At Commencement the faculty awards such honors as it sees fit to those who are to receive degrees. These honors ordinarily consist of a valedictory oration, a Latin salutatory, and other honorary orations and theses.

COMMENCEMENT.

The College year is so arranged as to provide a term of 14 weeks immediately before the Wednesday preceding Christmas day and two terms of 11 weeks each after the Christmas vacation, the vacation at Christmas and in the Spring being two weeks each. The annual Commencement usually falls on the third Wednesday in June but occasionally the fourth Wednesday. The three days immediately preceding Commencement day are set apart for special exercises. On Sunday, the first of these days, a Baccalaureate sermon is preached in the College chapel at eleven o'clock in the morning; and in the evening a sermon is preached in the auditorium of Pardee Hall before the Brainerd Society of the College by some distinguished minister selected by the Society. The preacher for 1913 was Rev. Rufus W. Miller, D.D., '83 of Philadelphia.

On Monday the Senior class holds its Class Day exercises on the campus.

The alumni and literary societies hold their reunions on Tuesday, and orations are delivered before the literary societies in the Society halls.

The regular Commencement exercises are held in the auditorium of Pardee Hall on Wednesday morning, the afternoon being occupied by the alumni dinner. All these exercises are open to the public. Various other exercises of an athletic or social nature are conducted on the part of the students under a general supervision by the faculty.

DEGREES.

THE FIRST DEGREE.—The degree of *Bachelor of Arts* is conferred on the graduates of the Classical Course; *Bachelor of Philosophy*, on those of the Latin Scientific Course; *Bachelor of Science*, on those of the General Scientific Course; *Bachelor of Science* (in Chemistry), on those of the Chemical Course; *Civil Engineering*, on those of the Civil Engineering Course; *Engineer of Mines*, on those of the Mining Engineering Course; *Electrical Engineer*, on those of the Electrical Engineering Course; *Mechanical Engineer*, on those of the Mechanical Engineering Course.

MASTER'S DEGREE.

MASTER OF ARTS.—The degree of *Master of Arts* may be conferred one year after graduation on any *Bachelor of Arts* who has pursued a prescribed course of study, equivalent to sixteen recitations per week, during one year in residence, passed the examinations, and presented a satisfactory thesis.

The same degree may be conferred two years after graduation on any *Bachelor of Arts* who shall have devoted at least one year exclusively to advanced study under the direction of the faculty, passed examinations in the studies pursued, and presented a satisfactory thesis.

Candidates for this degree must, in all cases, register on or before October 1st, and examination must be held at the College at least once in each college term. Theses must be presented for approval not later than May 1st. A registration fee of $5 and tuition fee of $100 per annum for residents, and $45 per annum for non-residents, is exacted of all graduate students.

MASTER OF SCIENCE.—The degree of *Master of Science* may be conferred upon any graduate of the scientific department upon conditions similar to those prescribed for the degree of Master of Arts.

CERTIFICATES.

Students who have been admitted to any department of the College, and have passed satisfactory examinations therein, may obtain certificates of the work which they have done if they have been in attendance not less than one year.

MEDICAL TREATMENT.

Beginning with the college year 1913–14 a college physician has been provided for the benefit of the students and for the information of the college authorities and the parents of students in the case of serious sickness. This physician is John Edgar Fretz, M.D.

The regulations with regard to his attendance upon students are as follows:

The college physician shall make one call for diagnosis and prescription at the expense of the College. When called to see students at their rooms he shall make a report of the diagnosis, with a recommendation of the course to be followed, to the Dean of the Students within twenty-four hours.

For continued attendance students may make their own arrangement with the college physician or some other physician approved by the college authorities. All calls after the call for diagnosis and all office calls shall be at the expense of the students.

RELIGIOUS INSTRUCTION.

The aim of Lafayette College is distinctly religious. Under the general direction of the Synod of Pennsylvania of the Presbyterian Church its instruction is in full sympathy with the doctrines of that body. At the same time religious instruction is carried on with a view to a broad and general development of Christian manhood within the lines of general acceptance among evangelical Christians, the points of agreement, rather than those of disagreement, being dwelt upon.

Prayers are held each morning in the chapel at 7.50 and religious services in the chapel Sunday mornings at 11 o'clock. All students are expected to attend these services. No exceptions will be made to this rule for morning prayers. Where there is some exceptional reason assigned by the parents, students will be permitted to attend one of the churches in Easton instead of the Sunday morning service. This permission will be granted only on request of parents and for sufficient reason.

Special sermons are preached before the College from time to time by distinguished ministers. The preachers for 1913 were: Rev. S. Hall Young, D.D., New York, N. Y.; Rev. William H. Foulkes, D.D., New York, N. Y.; Rev. J. Beveridge Lee, D.D., Philadelphia; Rev. George Gordon Mahy, Philadelphia; Rev. John R. Davies, D.D., Philadelphia; Rev. Robert M. Labaree, Urumia, Persia; Rev. Arthur J. Brown, D.D., New York, N. Y.; Robert H. H. Goheem, M.D., Medical Missionary to India; Rev. Samuel A. Martin, D.D., Shippensburg; Rev. Charles R. Erdman, Princeton, N. J.; Rev. Cornelius H. Patton, D.D., Boston, Mass.; Rev. R. P. D. Bennett, Germantown; Rev. Francis E. Higgins, "The Lumber-jack Sky Pilot;" Rev. Melvin Fraser, D.D., Batanga, Africa; Rev. Rufus W. Miller, D.D., Philadelphia; Rev. Leighton W. Eckard, D.D., Philadelphia; Mr. Dan Crawford, Africa; Rev. Walter H. Waygood, Philadelphia; Dr. Clarence A. Barbour, Rochester, N. Y.; Robert H. Nassau, M.D., Ambler; Rev. Griffen W. Bull, D.D., Scranton; Rev. Ford C. Ottmann, D.D., Stamford, Conn.; Rev. Francis E. Clark, D.D., Boston, Mass.; members of the faculty and local clergy.

The preacher for the Day of Prayer for Colleges, 1914, was Rev. Joseph W. Cochran, D.D. of Philadelphia.

Instruction in the Bible has always held a prominent part in the College, and a full account of the courses in Bible study will be found on pages 107–108.

LECTURES.

Special courses of lectures are given annually in connection with several departments and will be found under those departments. A more general course of a popular character is given each year.

TERMS AND VACATIONS.

The College year is divided into three terms, with intervening vacations, as given in the Calendar on page 6. All the classes are examined at the close of each term, and a report sent to the parents or guardian. Students are required to be present punctually at the beginning of each term, and are not allowed during term-time to be absent from town, except by written permission from the Dean.

The Wednesday before the third Thursday of October in each year is observed as Founders' Day, in memory of those who founded the College and of those who have since contributed to its usefulness. On Founders' Day, 1913, an address was delivered by Sir William Mitchell Ramsay, D.C.L., LL.D., Professor of Humanity, University of Aberdeen, Aberdeen, Scotland.

BUILDINGS, LABORATORIES, LIBRARIES.

The College grounds are situated upon the summit of a beautiful hill, overlooking the city of Easton. They are reached by a flight of stone steps, which ascend the bold front of the hill directly from the head of Third Street, or by electric cars, which skirt the face of the hill by a gradual incline. At the head of the steps stands the monument erected by the alumni association to their comrades who "died for the Union." The grounds contain about sixty acres terraced and laid out under the direction of Donald G. Mitchell. The buildings upon the campus are forty in number. The oldest of these is

SOUTH COLLEGE.

The central portion of this building was erected in 1833 and was the original college building. At later periods east and west wings were added and the whole building was thoroughly overhauled and modernized in 1909. It now contains a large part of the class and lecture rooms for the academic department, and the basement and first floor of the east wing have been fitted for a lecture room and laboratory for the Department of Mining Engineering.

The first and second floors of the west wings are occupied by the College Chapel. The remaining space in the main building and in the wings is devoted to dormitory rooms which have been thoroughly modernized, and every comfort afforded by modern plumbing and sanitary arrangements has been added.

The building has also been beautified by a portico on the south front and by many improvements in the general finish of the building.

The alterations have been intended to secure every needed improvement without altering the general effect of the building. The sentimental value of its historical place in the college life and thought have not been lost sight of.

Pardee Hall.

The most commanding position on the campus is occupied by this building, the most conspicuous evidence of the liberality of the late Ario Pardee, which reached to every department of the college. Here the departments of civil, mining, and electrical engineering are supplied with thoroughly equipped laboratories and lecture rooms, and the museums of these departments, and of general geology, mineralogy, and natural history are to be found. The Ward Library and the handsome rooms of the two literary societies are also in this building, and the central portion of the second and third floors of the main building contains a beautiful auditorium in which the Commencement exercises, lectures, and other public entertainments are held.

The Van Wickle Memorial Library.

The Van Wickle Library was dedicated on May 30, 1900. It has given to the College one of the most needed additions to its equipment. A beautiful building of Pompeian brick and terra cotta, thoroughly furnished with the most approved appliances for library work, it is at once a most beautiful and useful feature in the College's development. It contains a large reading room, in which the periodicals are to be found; a reference book department; a large room for the general storage of the library; librarian's room; and small rooms for special work.

The Library having grown to such proportions as to require additional storage room for books, Miss Marjorie R. Van Wickle, in January, 1911, presented to the College a sum sufficient to erect an addition to the Library, which is now completed. This addition contains book stacks sufficient for the storage of from ninety to one hundred thousand volumes. It is in the form of an extension to the north of the original building and was a part of the original plan. It will provide for the growth of the Library for many years to come and is a beautiful and valuable addition to the efficiency of the Library.

JENKS BIOLOGICAL HALL.

This building was erected in 1864–'65 by the late Barton H. Jenks, of Philadelphia. It was recently entirely remodeled.

THE GAYLEY LABORATORY OF CHEMISTRY AND METALLURGY,

completed in 1902, is occupied by the departments of chemistry and metallurgy. The building consists of three stories, and is constructed of Indiana stone, colonial brick, and gray terra cotta. It is fireproof, with steel and cement floors, and gives a thoroughly modern equipment to these departments. This building contains also the Henry W. Oliver Chemical and Metallurgical Library.

THE ASTRONOMICAL OBSERVATORY,

in addition to the Observatory proper, contains a lecture-room, with accommodations for the students in astronomy.

WEST COLLEGE

contains the lecture room for two generations used by Prof. Francis A. March, the great scholar and beloved teacher and now occupied by Prof. Francis A. March, Jr., and the offices of the registrar and treasurer of the College.

GYMNASIUM.

The importance of physical culture was early recognized by this College and a gymnasium was erected in 1884 and placed under the direction of a competent instructor. At the present time regular drills are required of the Freshmen four times a week. Optional training in general gymnastics and fencing is offered to upperclassmen, and the students are encouraged to participate in such outdoor sports as their physical development fits them for.

The gymnasium is equipped with all the apparatus requisite to physical training, with lockers, bath and dressing-rooms. Before taking part in the gymnasium exercises, or the outdoor sports every student is given a thorough examination, and great care is taken to give each student such exercises as he needs and to avoid anything that would be injurious. In addition to the Director, one of the most able and experienced physicians of Easton acts as consulting physician, and requests for special work or exception from any prescribed work are passed on by the Director and the Consulting Physician.

VAN WICKLE MEMORIAL LIBRARY.

No excuses from the required drills will be granted except upon the recommendations of these officials. A fine athletic field adjoins the campus. It is admirably equipped for athletic contests. Four recent classes erected a commodious field house on it. Here the contests in football, baseball, and track athletics, in which the students have excelled, are held.

No student may take part in any public contest without written permission from his parents previously filed with the Dean.

THE DORMITORIES.

A complete reorganization of the dormitory system was effected in the summer of 1900 by the building of central structures, known as Knox and Fayerweather Halls, to connect Blair and Newkirk Halls and Martien and Powell Halls, respectively, and the facing of the completed buildings with mottled Pompeian brick, handsomely trimmed with red terra cotta. The architectural beauty of the buildings is in marked contrast with the former appearance of the separate building. A complete sanitary plumbing system of baths, sinks, closets and electric lights has been installed in all the buildings. These improvements leave nothing to be desired for the health and comfort of the students.

FRATERNITY HOUSES.

Early in the current century the crowded condition of the dormitories made additional provision for rooms for the students imperative. To meet this need and to provide comfortable accommodations for their students, the fraternities represented in the College began the erection of a series of buildings, nearly all of which are situated on the College Grounds, which provide rooms and in most cases all of the conveniences of student life for the members of the various fraternities. There are now seven fraternity houses built upon a similar plan of providing accommodations for about eighteen students each. The buildings are a beautiful addition to the College equipment and are under the same supervision as the College Dormitories.

INFIRMARY.

A small building on McCartney Street immediately adjoining East College has been set apart for the use of students suffering from contagious diseases. This building has but rarely been called into service, but on several occasions has served to prevent the extension of contagion by the isolation of single cases of diphtheria and scarlet fever which have occurred. The building is intended exclusively for the use of students rooming in the college buildings. For non-contagious cases of a serious character, the excellent hospital of the city offers the best modern conditions of treatment.

BRAINERD HALL.

This building for the Y. M. C. A., the gift of J. Renwick Hogg, Esq., '78, of the Board of Trustees, was erected in 1902. It is a three-story gray stone building in the Tudor Gothic style. It contains a large room for the meetings of the society, and reading, writing, and committee rooms; also a trophy room of the athletic association, a room for the collection of curios from foreign missionary fields, and bowling-alleys in the basement.

Its object is to afford a home under active Christian influences for all forms of student life.

MECHANICAL LABORATORY AND SHOPS.

A building to contain the laboratories and shops of the Department of Mechanical Engineering is now completed.

This building is 102 feet by 185 feet, of steel and concrete construction, and contains, on the main floor, a wood-working shop 45 feet by 75 feet, a machine shop of the same dimensions, and a laboratory 45 feet by 150 feet, for steam and gas engineering. In the rear a forge shop and foundry 40 feet by 45 feet each, also boiler and storage rooms, lockers and lavatories.

This building is a part of a proposed plan of a complete set of engineering buildings to furnish better facilities to carry on the work of the four departments of engineering.

CENTRAL STEAM PLANT.

During the autumn of 1909 a central steam plant was established with a power house built of stone with a concrete roof containing large boiler and storage rooms with every convenience for the running of the plant. The power house is equipped with four 150-horse-power boilers which are sufficient for the present need of the College and any probable additions for a considerable number of years to come. Provision is also made for the addition of an electric power plant whenever it shall be deemed desirable. This plant is now in full and successful operation and promises to be a great value to the College.

OTHER BUILDINGS.

The remaining buildings consist of a large GREENHOUSE, a useful adjunct to the department of botany, and also supplying flowers and plants for the adornment of the grounds in summer and of the buildings on public occasions. Besides these, a number of buildings are occupied as the HOMES OF THE MEMBERS OF THE FACULTY. The intimate relations resulting from the residence of both faculty and students upon the College grounds are regarded as one of the most wholesome features of the College life.

LIBRARIES AND READING-ROOM.

The main regular College Library occupies the Van Wickle Memorial Library, described previously. The College Library was established at the foundation of the College, and has had a steady and uninterrupted growth since 1832, and is chiefly made up of books bearing directly on the courses of instruction. The Ward Library, the gift of the heirs of C. L. Ward, Esq., of Towanda, is largely made up of books of general literature and history and political science. Each of the technical departments has also a collection of books, magazines, and other scientific publications in rooms in immediate connection with their lecture rooms and laboratories. By the gift of $5,000 Mr. Henry W. Oliver laid the foundation of the H. W. Oliver Chemical Library in the new Gayley Laboratory. The foundation has been added to by gifts from Prof. Edward Hart and others, and the incorporation of the College's collection of chemical works.

A friend of the College has bought and presented to the Henry W. Oliver Chemical and Metallurgical Library all the pamphlets, about three thousand in number, belonging to the library of the late Prof. Johannes Wislicenus, of the University of Leipsic.

The literary societies, also, have libraries numbering about 6,000 volumes, largely of a literary character, which valuably supplement the more solid libraries of the College.

The College Library contains a papyrus scroll, five feet long, from a mummy at Thebes, with a hieratic inscription—pronounced by Seyffarth the finest he has seen—presented by the late Hon. John Garrett, of Baltimore, of the class of '37, and a collection of prints and medals of General Lafayette presented by the late President William C. Cattell, D.D., LL.D.

There is also a full-length portrait of Lafayette, by Healey, presented by the late Dr. Thomas W. Evans, of Paris.

ALUMNI ALCOVE.—A collection of books and pamphlets written by the students, alumni, faculty and trustees of the College is being gathered and set apart as a "Lafayette Library" to represent the literary activities of the College. This unique and valuable collection now numbers about 600 volumes, and includes a full set of the College catalogues from 1832 to the present time, the Commencement addresses, and official publications of the College.

The LIBRARIES have received gifts, which are hereby gratefully acknowledged, from the following individuals and institutions:

Individuals:

Brig. Gen. L. H. Carpenter; Prof. Selden J. Coffin (3); Frank Firmstone (49); Albert Gehring (2); Rev. James I. Good; Prof. Otho M. Graves; Charles B. Green; F. L. Greeno; Prof. Edward Hart (16); Jacob H. Holt (7 pamphlets); Dr. Ewing Jordan (pamphlet); John W. Jordan (1 vol., 2 pamphlets); Dr. R. Clement Lucas; Elwood H. McClelland; Rev. C. C. Millar; R. Burnham Moffat; James Monaghan; Rev. Robert H. Nassau; Hon. George T. Oliver (71); Prof. William B. Owen (3); Hon. A. Mitchell Palmer (5 vols., 20 pamphlets); Edward J. Pranke; Dr. F. W. Putnam (Lafayette Print); Prof. Edwin M. Rankin; George L. Raymond; William Reynolds; Rev. James Robinson; Mrs. Philip Sawyer (2); Hon. H. W. Scott; Prof. Hervey W. Shimer (2 pamphlets); Rev. J. F. Stonecipher; Paul M. Thomas (12); Harvey Maitland Watts; Ethan A. Weaver (1 vol., framed map of Easton in 1850); Hill P. Wilson.

Firms and Institutions:

American Iron and Steel Institute; Bryn Mawr College; Chemical Publishing Co. (2); Class 1914 (2); Columbia University (3); T. S. Denison & Co.; Doubleday, Page & Co.; Harvard University; Hooker Electrochemical Co.; Illinois State Geological Survey (3); Illinois State Water Survey; Los Angeles Examiner (2); Massachusetts State Board of Health; Michigan State Board of Health; National Academy of Sciences; Natural Ice Association of America; New Brunswick Theological Seminary; Peace Association of Friends of Philadelphia; Pennsylvania Society of New York; Princeton Theological Seminary; Princeton University; University Club of New York City; University of Michigan (3); University of Pittsburgh.

Canadian Departments:

Dominion Astronomical Observatory.

United States Departments:

Bureau of American Ethnology; Library of Congress (3); National Museum; Navy Department (2); Smithsonian Institution (3).

The class of 1871 has given to the College a fund, the proceeds of which are to be used for the purchase of the publications of the Early English Text Society. The library now contains a large and valuable collection of these.

The class of 1875 at its reunion in 1905 by the gift of one thousand dollars established an alcove in the library to be known as "The Francis A. March Alcove."

The class of 1892 at its decennial reunion in 1902 established and alcove in the library devoted to American literature. Two hundred volumes have been purchased and additions will be made from time to time.

SCIENTIFIC COLLECTIONS.

These are extensive and valuable, and are rapidly increasing from year to year by gifts from societies and individual donors, and by special appropriations in addition to the fees for registration and matriculation.

Among the most valuable of the collections may be mentioned the extensive herbarium, collected by Prof. Thomas C. Porter during forty years of enthusiastic labor; it is especially rich in North American plants and is believed to contain the most complete flora of Pennsylvania in existence and the series of Ward's celebrated casts, illustrating geology and palaeontology.

The apparatus in the department of physics and applied mechanics, the instruments used in the departments of astronomy and engineering, and the scientific equipment of the numerous and extensive laboratories meet the demands of advanced instruction in these departments; a special feature, however, is the series of nine hundred wall charts, executed at the College by Gustave Garnier, under the direction of the professors in the departments of astronomy, chemistry, physics and applied mechanics, metallurgy, and natural history. There are valuable models in machine drawing, stone cutting, crystallography, and architecture.

COLLEGE SOCIETIES.

LITERARY SOCIETIES.

The *Washington* and *Franklin* societies were organized early in the history of the College and are conducted by the undergraduates. Both societies have well-furnished apartments in Pardee Hall, and valuable libraries. They meet every Wednesday evening for literary exercises, consisting of orations, essays, and debates. A generous rivalry for College honors exists between them, and each year representatives of the two societies from the Junior class engage in a public contest in oratory. On the day before Commencement the societies hold reunion meetings in their halls. These societies are an important part in College life and work, and *all the students are strongly advised to join them.*

BRAINERD EVANGELICAL SOCIETY.

The *Brainerd Evangelical Society*, as a society of inquiry, meets each Thursday evening and on the first Friday of each month in the interest of missions, and for the promotion of Christian effort. Its public anniversary is held on Sabbath evening of Commencement week, at which time a sermon is preached usually by some former member of the Society. In 1913 the preacher was Rev. Rufus W. Miller, D.D., '83, Philadelphia.

BIOLOGICAL SOCIETY.

The *Biological Society* is for the purpose of making its members intelligent concerning the important biological questions of the day, enabling them to appreciate the value of research in nature. The membership consists of those students of the three upper classes who are either prospective or present members of the classes in biology, and of such graduate students as are interested in the laws of life comprehended through the natural history sciences.

CHEMICAL CLUB.

A *Chemical Club* has been organized by the students, for reading and discussing papers contained in the current chemical magazines, and to listen to lectures from visiting chemists.

DEUTSCHER VEREIN.

Der Deutsche Verein is an organization of students and officers interested in the study of German language and literature, and of German life and culture. Meetings are held fortnightly on Thursday. Advanced students and others who desire to keep up their knowledge of German are invited. The program consists chiefly of conversations, addresses and the singing of German songs.

CLASSICAL UNION.

The *Classical Union* is an association which aims to bring together the students of the culture courses and to promote the interests of classical study in the College. Lectures on important subjects are given from time to time by members of the faculty and by eminent scholars from other institutions.

ELECTRICAL ENGINEERING SOCIETY.

A Branch of the American Institute of Electrical Engineers has been organized by the students in the Department of Electrical Engineering. Meetings are held weekly. Papers are written, abstracts prepared and discussions held over important engineering projects or developments.

EXPENSES.

The annual College charges at present are $145, and the charges will be the same for all students entering before the first day of June, 1914. This amount is made up as follows:

Tuition (For students entering after June 1, 1914, see below)	$100.00
General expenses	24.00
Library and Reading-room	15.00
Gymnasium	6.00

These fees are payable in three instalments at the beginning of each term.

Beginning with the college year 1914–15 and applying to all new students entering after June 1, 1914, the tuition in the courses of Engineering and Chemistry will be $150 per annum. The same charge will be exacted from students who are pursuing courses of study identical with the courses in the technical school, though not candidates for a technical degree. The reason for this increase in tuition is the great increase in the cost of education in the technical departments and the fact that other institutions of a like grade have already raised their fees to an equal or greater amount.

After June 1, 1914, the tuition will be payable one-half at the beginning of the first term, and one-fourth at the beginning of the second and third terms.

In addition to the above fees the following special fees are charged:

Entrance Fees.—Each student pays $5 when he is registered for examination on entering College, and $10 when he is matriculated, thirty days afterwards. These fees are appropriated in part to the increase of the scientific collections and apparatus. No fees are charged for diplomas.

Laboratories and Fees.—A fee is charged in each of the laboratories to meet the expenses incident to the work of the student. In the chemical laboratories the fee is based on the apparatus used and the chemicals consumed. In other laboratories a flat rate is charged based upon the average cost. These fees are payable at the beginning of the term.

A deposit of $1 is also made at the beginning of each term to pay for public damages, the unexpended balance of which is returned to the student at the end of the year.

Scholarships.—Aid is given to young men of ability, industry and character who are properly recommended to the College authorities. It is the object of all scholarships granted under this head to aid worthy young men and to attract especially desirable students to the College. Special consideration has always been given to the sons of ministers and of teachers, and to candidates for the Christian ministry. The aim, however, has not been to create a favored class but to recognize the generous support which the College has received and peculiar advantages which young men of unusual early training bring to the College. The amount of aid will depend upon the necessities of the applicant but in no case will exceed the amount of the tuition fees. No aid is granted to students pursuing special or incomplete courses of study or to those who are not fully prepared to take advantage of the opportunities offered by the College.

Students who receive aid are required to maintain an average in scholarship equal to the average of their respective classes and in case of failure in any subject to remove the condition before the expiration of thirty days from the beginning of the next term. Scholarships which are granted at the beginning of the Freshman Year will be renewed annually subject to the general rules, but no scholarship which is lost on account of a failure to maintain the standard required will be renewed except at the beginning of a college year.

Applications for aid should be made to the President as early as possible after the first of January of the year in which the student expects to enter.

Scholarships offered as prizes in certain schools will be under the same regulations as other aid. The endowed scholarships issued to individuals prior to the establishment of the Scientific Department will provide free tuition in the Classical or Latin Scientific Courses and one-half tuition in the Technical Courses.

BOARD, ROOMS, WASHING.

In all cases the place of boarding must be approved by the Faculty. The price of table board in clubs managed by the students at present averages from $4.00 to $5.00 per week. Board, including furnished room, in private families, is from $4.50 to $6 per week. Washing costs 40 cents per dozen pieces.

Unfurnished rooms in the College buildings rent for $8 to $33 a term, unfurnished rooms adjacent to the College premises for $12 to $16 a term or furnished rooms for $15 to $30 a term.

The steam-heated dormitories are lighted by electricity, the cost of which to each of the occupants is $9 a year. The charge for heating is $12 a year for each occupant.

Students are expected to room in the College dormitories unless they receive permission to room elsewhere. If they do not occupy College rooms, they are subject to an assessment to meet the loss to the College for rooms left vacant. The reason for this is that the funds of the College have been invested in the dormitories in order to secure cheap and convenient lodgings for the students, and it is to the advantage of all that the buildings should be occupied, the income from the investment being essential to the work of the College, and the students being protected against exorbitant rents.

Information in regard to the selection of rooms can be had from Professor William T. Lyle, Inspector of College buildings, the buildings being open for inspection during each term, and three days preceding the first day of each term. Rooms are assigned only to students who have been admitted to College, or who present full certificates from authorized schools, in the order of their application.

College Bills.—College bills must be paid in advance. No student is enrolled for any term until his bill is paid and a student may be dropped from the roll of the Faculty at any time upon notice from the Treasurer that his college bill is overdue and unpaid. It is the duty of every student to present himself at the office of the Treasurer at the opening of each term, see that his bill is correct and pay it. Those who wish their bills sent home may have them sent to their parent or guardian if prompt request is made after their bills have been examined and found correct. No bills will be sent home upon a general request, and any neglect of early attention to a college bill will forfeit the right to any extension that would otherwise be granted.

For the convenience of the students it is arranged that payments of the bills shall be made by the Seniors on the first Thursday of each term, by the Juniors on the first Friday, by the Sophomores on the first Saturday, and by the Freshmen on the first Monday. No student is regarded as regularly enrolled for any term until his bill is paid. He may be dropped from the roll for neglect of his bill at any time upon notice from the Treasurer to the faculty. Where it is impossible for a student to pay his bill when due, the Executive Committee has power to extend the payment for a period of not more than thirty days from the beginning of the term. Such extension will only be granted upon written request filed with the Treasurer within ten days after the beginning of each term, giving a satisfactory reason for the extension asked for. A penalty of ten per cent. will be added to every bill remaining unpaid after the expiration of thirty days. No student, whose bill is unpaid, shall be permitted to take the term examinations.

Students entering after the middle of the term shall pay one-half of the College charges for the term. Students obliged, on account of sickness, to leave before the middle of the term may have refunded to them one-half of the College charges for the term; no reduction will be made to those leaving for any other cause.

Annual Expenses.—Some money for books and other incidental expenses will be needed, but, with close economy, the total annual expenses—exclusive of clothing, traveling expenses and laboratory fees—need not exceed $400, as will be seen from the following summary:

	Liberal.	Moderate.	Minimum.
General college expenses	$ 24.00	$ 24.00	$ 24.00
Charge for College reading-rooms, gymnasium, etc.	21.00	21.00	21.00
Board, 36 weeks, at $4.00 to $5.00	175.00	160.00	144.00
Rent of College-room, $24 to $99	99.00	49.00	24.00
Light and fuel	21.00	21.00	21.00
Washing	25.00	16.00	12.00
Tuition*	100.00	100.00	100.00
Books and stationery	48.00	40.00	32.00
	$513.00	$431.00	$378.00

Laboratory fees and damage assessments, which vary in amount, must also be added, while the personal expenses for clothing, etc., must be estimated according to individual experience. The first year will be made more expensive by the fees for registration and matriculation, and furnishings for room.

Parents and guardians at a distance may deposit funds with some member of the faculty, who will pay particular attention to the pecuniary concerns of the student, settling his bills, and transmitting an account of the expenditure, for which services he will charge a commission. It is strongly recommended that parents furnish their sons with little beyond what will meet their necessary expenses.

BEQUEST AND DEVISES.

Each state has special statutory regulations in regard to wills, and it is most important that all testamentary papers be signed, witnessed, and executed in all other respects according to the laws of the state in which the testator resides. In all cases, however, the name of the corporation must be accurately given, as in the following forms:

---

* See page 170 for increase in tuition in the Courses in Engineering, and Chemistry and Courses identical with the Courses in the technical school.

I give, devise, and bequeath to "Lafayette College," in Easton, Pennsylvania, its successors and assigns forever, the sum of ....dollars, to be invested by said corporation in good real estate security, and the interest accruing therefrom to be applied to the support of the Professors in said College.

I, give, devise, and bequeath a certain lot situated, etc., to "Lafayette College," in Easton, Pennsylvania, and to their successors and assigns forever, for the uses and purposes of said College, according to the provisions of its charter.

PRIZES.

The following prizes are offered annually:

THE FRANCIS A. MARCH PRIZE IN ENGLISH.

A prize of thirty dollars in books was given from 1862 to 1881 by the late Rev. William C. Fowler, LL.D., of Durham, Connecticut, and since 1881 has been continued by Henry A. Potter, M.S., class of '77, of New York, under the title of "The Francis A. March Prize," upon the following conditions:

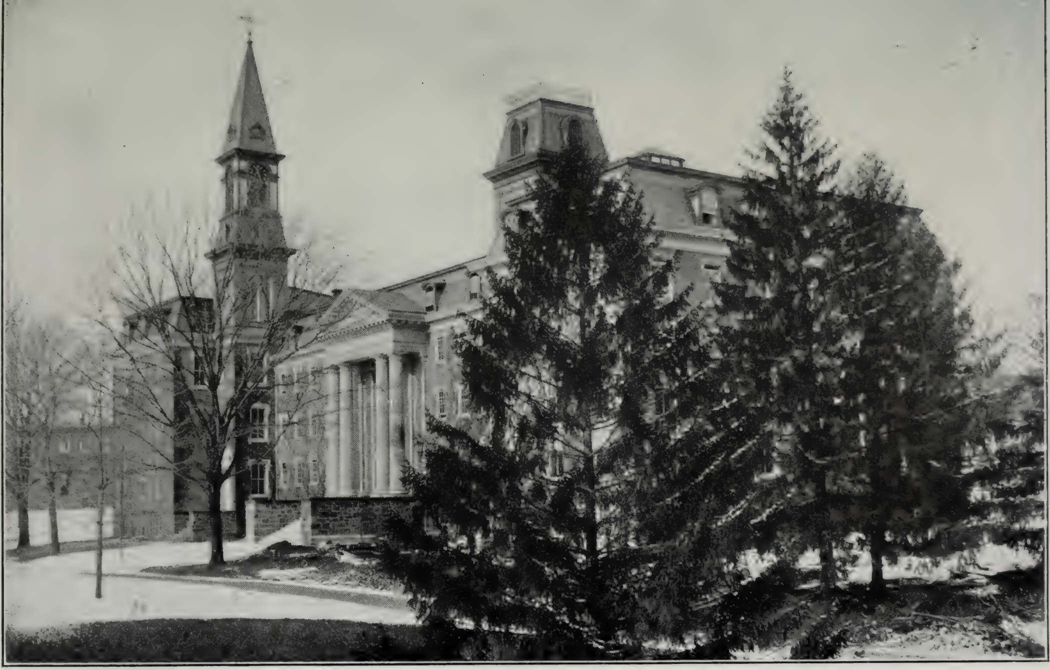
"A committee of at least three shall be chosen by the faculty to determine which student of the Senior class has made the greatest proficiency in English philology.

"The decision of the committee is to be made after attending an examination in some English classic, conducted by the professor in English, and after reading essays written by the several members of the class, which shall contain a discussion of the language of some English classic."

The subject in 1914 will be the works of Stevenson.

THE ASTRONOMICAL PRIZE.

A prize of thirty dollars in gold is awarded to the student making the greatest progress in the study of astronomy in the Senior year.



SOUTH COLLEGE.

MATHEMATICAL PRIZE.

Two prizes, of the value of twenty dollars each are offered to those students of the Sophomore class, who shall have exhibited during the first two years of the course the greatest proficiency in the study of Mathematics. In 1912 these prizes were given to students in the Technical departments and in 1913 they were awarded to students in the Classical, Latin Scientific and General Courses of the Scientific department, and hereafter they will be awarded in alternate years to students in the two Mathematical courses.

These prizes were founded, as was the Astronomical prize above mentioned, in 1867, by Professor Traill Green, M.D., LL.D.

THE LOUNSBURY PRIZE IN CHAUCER.

A prize, consisting of books is given to that student of the Sophomore class who shall present the best essay upon some one of the works of Chaucer. This prize was given in 1896 by Thomas R. Lounsbury, professor of English at Yale University, and will be continued by friends of the College as the Lounsbury prize in Chaucer.

THE EARLY ENGLISH TEXT SOCIETY'S PRIZE.

A prize, consisting of books of the Early English Text Society, of London, is given to that student of the Sophomore class who shall, at the close of the Sophomore year, pass the best examination in "English before Chaucer." The examination is based upon selected texts announced from year to year, which in 1914 will be from the New Testament.

This prize was founded in 1871.

THE CLASS OF '83 PRIZE.

A prize of the value of fifteen dollars is annually awarded to that member of the Sophomore class who shall have attained the highest standing in his division of the class in Trench on the Study of Words.

This prize was founded by the class of 1883 at their graduation.

COLEMAN BIBLICAL PRIZE.

Prizes, each of the value of ten dollars, are awarded to those students of the Freshman class who have attained the highest standing in the several divisions of Biblical study in that year.

These prizes were founded by the Rev. Lyman Coleman, D.D., in 1880.

PRIZES IN ORATORY.

The Washington and Franklin literary societies appropriate one hundred dollars a year for prizes in oratory. Four contestants are chosen from each Hall to take part in the Junior Oratorical Contest, which is held in May. In the presence of a public audience three judges, approved by the faculty, hear the speakers and award the prizes. Their decision is based on the merit of the performances as to originality and force, with reference both to composition and delivery. The first prize is fifty dollars, the second prize thirty dollars, and the third prize twenty dollars.

CIVIL ENGINEERING PRIZE.

A prize of the value of fifty dollars, the gift of Carrol Phillips Bassett, C.E., Ph.D., of the class of 1883, is annually awarded to that member of the graduating class who presents the best graduating thesis and attains the highest standard of scholarship in the Civil Engineering Course.

THE PARK PRIZE IN LATIN.

A prize of fifteen dollars for the Latin Department has recently been founded by Mr. Samuel R. Park, A.M., '84. In 1914 it will be awarded, on the work of the second and third terms Freshman class, for excellence in Horace.

HISTORICAL ESSAY PRIZE.

A prize consisting of a copy of his work, "*The Marquis de Lafayette in the American Revolution,*" is given annually by Charlemagne Tower, Jr., LL.D., of Philadelphia, to that member of the Senior class who shall, on or before the first day of October, present the best essay on some subject connected with the relations of *France and the United States.* The essay must not exceed three thousand words in length. The subject for the year 1914 is: "*The value of the French Alliance in the American Revolution.*"

THE CHEMICAL ESSAY PRIZES.

A prize of five dollars in books is awarded each term to that member of the Junior or Senior class who shall present the best term theme on some chemical subject.

THE GILBERT PRIZE IN OLD ENGLISH.

By the will of Howard Worcester Gilbert, who died in Chester County, March 5, 1895, a bequest was left to the College, with the provision that a gold medal of the value of forty dollars should be awarded every two years to the student writing the best essay on the Old English Language and Literature, beginning with Beowulf, in the earliest Anglo-Saxon period, and extending down to the year 1070. Should the competitors be of equal merit, preference is to be given to residents of Pennsylvania.

The medal is an inch and three-fourths broad, three-sixteenths of an inch thick, and contains on its face a relief portrait of King Alfred with the date 871–901, surmounted by the Anglo-Saxon phrase, "Naes he gold hwaete." The reverse shows a garland encircled with the legend, "Howard Worcester Gilbert Old English Prize. Founded 1895." Space is left for the name of the recipient.

This prize will be awarded at the Commencement of 1914. It is open to competition of students of Anglo-Saxon in the graduate course of 1913–14. The essay must be handed in by May 1, 1914.

'85 PRIZE IN PHYSICS.

The class of 1885 founded a prize in 1897 in the sum of $500, the annual income of which is given to that member of the Junior class who attains the highest rank in the studies of physics.

THE BLOOMBERGH PRIZE.

The class of 1888, at its decennial reunion, subscribed the sum of $500, the annual income of which is awarded to that member of the Junior class who shall attain the greatest proficiency in the study of the French and German languages and their literatures.

THE JAMES ALEXANDER PETRIE PRIZE.

A prize of the annual value of $50 has been put at the disposal of the College as a memorial to the late James Alexander Petrie, M.D., of Phillipsburg, New Jersey. It will be awarded to that member of the Junior class who shall attain the greatest proficiency in the Department of Romance Languages.

THE B. F. BARGE GOLD MEDAL.

A prize of a gold medal of the value of $100 was founded by Benjamin F. Barge, Esq., of Mauch Chunk, Pa., to be awarded to that member of the Senior class who shall deliver the best oration in an annual contest to be held on Memorial Day, May 30th. The contestants, not more than six in number, are to be chosen by a committee of the faculty from those members of the Senior class, who shall hand in orations on or before May 1st upon topics assigned by the committee not later than March 25th of each year.

BARGE MATHEMATICAL PRIZES.

By the bequest of the late Benjamin F. Barge, Esq., of Mauch Chunk, three prizes of a total value of one hundred dollars have been established for excellence in mathematical studies. These prizes are awarded to members of the Sophomore class for excellence in the solution of original problems. In 1912 these prizes were given to students in the Classical, Latin Scientific and general courses of the Scientific department, and in 1913 they were awarded to students in the technical departments, and hereafter they will be awarded in alternate years to students in the two mathematical courses.

THE R. B. YOUNGMAN GREEK PRIZE.

The class of 1884, at its vigintennial reunion, subscribed the sum of $500, the income of which is to be awarded to that member of the Sophomore class who shall attain the greatest proficiency in Greek.

THE NEW SHAKESPEARE SOCIETY'S PRIZE.

A prize of books is awarded to that member of the Junior class who passes the best general examination upon Shakespeare, his works, life, character, etc.

NOTE.—In all cases where a prize is awarded to an assay or oration the successful competitor must hand to the proper authority two typewritten copies of his production before receiving the prize, if he is requested to do so.

DEGREES CONFERRED.

HONORARY DEGREES.

June 18, 1913.

Doctor of Laws.—Cheesman Abiah Herrick, President of Girard College, Philadelphia.

Doctor of Divinity.—Rev. Andrew Neely Hagerty, '81, Carlisle; Rev. Isaiah Mench Chambers, '89, Merchantville, N. J.; Rev. John Francis Dobbs, '97, Syracuse, N. Y.

Master of Science.—Victor St. Clair Dumont, Ex-'98, Hoboken, N. J.

DEGREES IN COURSE.

June 18, 1913.

Bachelor of Arts.—Frederick Lucien Bird, Pa.; William Miller Bond, Pa.; Adam Brown Caldwell, Pa.; Angelo Maria Centanni, Pa.; William Levin Coleman, Pa.; George Maximilian Dery, Pa.; Charles Garfield Eichlin, Pa.; Herbert Moses Horne, Pa.; Matthew Hale Jones, Jr., Pa.; Andrew McClenathen Lowry, Pa.; Gilbert Nickel, Pa.; Charles Leonard O'Brien, Pa.; David Bishop Skillman, Pa.; George Raymond Waterbor, Pa.; Thomas Allen Wright, Jr., Pa.; William Norris Wysham, Md.

Bachelor of Philosophy.—Robert Alexander Altschuler, N. J.; James Burns Amberson, Jr., Pa.; Francis Shunk Brown, Jr., Pa.; Ralph Greenfield Chapman, N. J.; Edward Gilmore Cunningham, Pa.; Raymond Herbein DeTurck, Pa.; Herbert Henry Eichlin, Pa.; Russell Holcombe Fisher, N. J.; Louis Fernald Foster, N. J.; Leslie Newton Gay, Pa.; Newell Hardy Grace, N. Y.; Robert Elliot Haas, Pa.; Arthur Browne Hammond, Jr., Pa.; Jay Irvin Henshaw, Pa.; Lewis Hoke Kelly, Pa.; David Francis Kennedy, O.; Paul Fisher Landis, Pa.; Hugh McCauley Miller, Pa.; Harry Waters Moore, N. J.; Charles Knauss Reinké, Pa.; George Andrew Reiss, N. J.; Lloyd Roberts, Pa.; Harry Thomas Shannon, N. Y.; Max Tischler, Pa.; Clifford Sharp Trimmer, N. J.; James Robert Winner, Del.; David Ober Wolf, Pa.

Bachelor of Science.—Harry Thorton Francis, Pa.; Henry Butts Huselton, N. J.; James Lee Pardee, Pa.; Edgar Hoffer Royer, Pa.

BACHELOR OF SCIENCE IN CHEMISTRY.—Lorenz Kneedler Ayers, Pa.; Richard Douglas Cheesman, Pa.; Louis Creveling, N. J.; Irwin Taite Darlington, Pa.; James Aloysius Fleming, N. H.; Thomas Armstrong Garretson, N. J.; William David Gross, N. Y.; Alfred Weikel Shoemaker, Pa.; Alfred Leroy Spengler, Pa.; Harry Elmer Tyson, Pa.; Cornelius John Ward, N. J.; Roy Pursel Wilson, N. J.; Harry Smedley Wolf, Pa.; Burton Guy Wood, N. Y.; John Ephraim Young, Pa.

CIVIL ENGINEER.—Gordon Harold Bannerman, N. J.; Frank Eisberg, Pa.; Morris Sloan Evans, Pa.; Harry Clarence Fernau, Pa.; George Van Sise Keely, N. J.; Milton Paine Kitchel, N. J.; Frederick Moorby, N. Y.; Alfred Biddle Pearson, Pa.

MINING ENGINEER.—Samuel Seymour Ball, N. Y.; Isaac Carpenter Clark, D. C.; John Fackenthal Magee, Pa.; Lawrence Heck Stone, Pa.

ELECTRICAL ENGINEER.—Charles Webster Andrews, N. Y.; Howard Milton Bliem, Tex.; Edwin James Fager, Jr., Pa.; Jerome Edward Fishel, D. C.; William Oscar Hay, Jr., Pa.; George Heilman Heydt, Pa.; Warren Woodward LaBarr, Pa.; William Evan Lloyd, Jr., Pa.; Frederick William Maue, Pa.; Russell Henry Wolbach, Pa.

COMMENCEMENT DISTINCTIONS, 1913.

HONORS.—Charles Garfield Eichlin, Easton; Frederick William Maue, Hazleton; Frederick Moorby, Jamestown, N. Y.; William Norris Wysham, Baltimore, Md.

ORATIONS.—James Burns Amberson, Jr., Waynesboro; Lorenz Kneedler Ayers, Easton; Adam Brown Caldwell, Williamsport; Angelo Maria Centanni, Philadelphia; Isaac Carpenter Clark, Takoma Park, D. C.; Louis Creveling, Bloomsbury, N. J.; Frank Eisberg, Easton; Jerome Edward Fishel, Washington, D. C.; Jay Irvin Henshaw, Honesdale; John Fackenthal Magee, Easton; Harry Waters Moore, High Bridge, N. J.; Gilbert Nickel, Easton; Clifford Sharp Trimmer, Middle Valley, N. J.; Harry Elmer Tyson, Weatherly; James Robert Winner, Wilmington, Del.; Burton Guy Wood, Johnstown, N. Y.

PRIZES AWARDED.

SENIOR PRIZEMEN.

THE FRANCIS A. MARCH PHILOLOGICAL PRIZE: Gilbert Nickel, Easton.

THE ASTRONOMICAL PRIZE: William N. Wysham, Baltimore, Md.

THE B. F. BARGE PRIZE IN ORATORY: Angelo M. Centanni, Philadelphia.

JUNIOR PRIZEMEN.

THE CLASS OF '85 PRIZE IN PHYSICS: Earnest C. Watson, Columbus, Ohio.

THE BLOOMBERGH PRIZE IN MODERN LANGUAGES: Divided between William A. Herr, Hazleton; Frank J. Reiser, Hollidaysburg.

THE JAMES ALEXANDER PETRIE PRIZE IN ROMANCE LANGUAGES: Roger L. Totten, Jersey City, N. J.

THE SHAKESPEARE PRIZE: Earl D. Gardner, Easton.

THE JUNIOR ORATORICAL PRIZES:

- FIRST: Walter D. Barker, Matawan, N. J.
- SECOND: Fred N. Miller, Easton.
- THIRD: Vergil A. Davison, Easton.

THE CHEMICAL ESSAY PRIZES: Theodore W. Chandler, Scranton and Peter J. Naher, Scranton.

SOPHOMORE PRIZEMEN.

THE TRAILL GREEN MATHEMATICAL PRIZES:

- FIRST: Wilbur A. Bryan, Hackettstown, N. J.
- SECOND: Divided between William R. Amberson, Waynesboro and William R. Audre, Stroudsburg.

THE LOUNSBURY PRIZE IN CHAUCER: William R. Amberson, Waynesboro.

THE EARLY ENGLISH TEXT SOCIETY'S PRIZE: George R. Miller, Jr., Easton.

THE CLASS OF '83 PRIZE IN ENGLISH: William R. Amberson, Waynesboro.

THE B. F. BARGE MATHEMATICAL PRIZES:

FIRST: Andrew G. Bisset, Washington, D. C.
SECOND: Gerald G. Grant, New York, N. Y.
THIRD: Robert E. Ellis, Paterson, N. J.

THE R. B. YOUNGMAN GREEK PRIZE: George R. Miller, Jr., Easton.

FRESHMAN PRIZEMEN.

THE LYMAN COLEMAN BIBLICAL PRIZES:

DIVISION A: James M. Brittain, Muncy.
DIVISION B: Lloyd M. Felmly, Phillipsburg, N. J.
DIVISION C: Ray D. Herring, Pen Argyl.
DIVISION D: Robert L. Logan, Philadelphia.
DIVISION E: Elbert B. Pickell, Whitehouse, N. J.
DIVISION F: Willard A. Pollard, Jr., Washington, D. C.
DIVISION G: Charles S. Wheeler, Newville.

THE PARK PRIZE IN LATIN: Bernard S. Hoffenstein, Wilkes-Barre.

CLASS MONITORS.

Appointed for general excellence in study:

SENIOR CLASS: Earnest C. Watson.
JUNIOR CLASS: William R. Amberson.
SOPHOMORE CLASS: Willard A. Pollard, Jr.
FRESHMAN CLASS: Benjamin G. Daun and Warren K. Sherman.

THESES PRESENTED BY CANDIDATES FOR DEGREES IN THE TECHNICAL COURSES OF THE PARDEE SCIENTIFIC DEPARTMENTS.

1. The Design of a Sanitary Sewer System and Sewage Disposal Plant for Lafayette College.
   FRANK EISBERG, Easton.
   HARRY CLARENCE FERNAU, Jeddo.
2. The Elimination of the Grade Crossing at Union Square, Phillipsburg, N. J.

George Van Sise Keely, Bayonne, N. J.
Frederick Moorby, Jamestown, N. Y.

3. A Hydrographic Survey of the Bushkill at Easton, Pa.
Morris Sloan Evans, Berwick.
Gordon Harold Bannerman, Titusville, N. J.

4. A Comparison of the Extensometers.
Milton Paine Kitchel, Boonton, N. J.

5. Efficiency Test of a Doble Impulse Water Wheel.
Alfred Biddle Pearson, Wyncote.

6. The Purification of Commercial Selenium.
Lorenz Kneedler Ayers, Easton.
Cornelius John Ward, Phillipsburg, N. J.

7. Strontium Nitrate from Celestite.
Richard Douglas Cheesman, Easton.

8. The Action of Superheated Steam on Cellulose.
Louis Creveling, Bloomsbury, N. J.
Alfred Leroy Spengler, Easton.
Harry Elmer Tyson, Weatherly.

9. The Preparation of Uranium Nitrate from Pitchblende.
Irwin Taite Darlington, West Chester.

10. The Preparation of Pure Alumina from Alum.
James Aloysius Fleming, Manchester, N. H.

11. The Purification of Commercial Tellurium.
Thomas Armstrong Garretson, Perth Amboy, N. J.
William David Gross, Kingston, N. Y.

12. The Utilization of the Corncob.
Alfred Weikel Shoemaker, Allentown.

13. The Separation of Iron and Aluminum.
Roy Pursel Wilson, Phillipsburg, N. J.

14. The Action of Chemicals on Aluminum.
Harry Smedley Wolf, Reading.

15. The Utilization of the Cornstalk.
Burton Guy Wood, Johnstown, N. Y.
John Ephraim Young, Easton.

16. Review of the Mining and the Concentration of the Magnetite Ore at Mineville, N. Y.
    JOHN FACKENTHAL MAGEE, Easton.
    SAMUEL SEYMOUR BALL, Elmira, N. Y.
17. Review of the Mount Hope Magnetite Mines at Mount Hope, N. J.
    ISAAC CARPENTER CLARK, Takoma Park, D. C.
    LAWRENCE HECK STONE, Easton.
18. Water Power Development in the United States and the Possibilities of Future Development.
    CHARLES WEBSTER ANDREWS, Buffalo, N. Y.
19. A Study of Incandescent Lighting Rates.
    HOWARD MILTON BLIEM, San Antonio, Texas.
20. The Flicker Photometer and Ulbricht's Sphere.
    EDWIN JAMES FAGER, JR., Harrisburg.
    GEORGE HEILMAN HEYDT, Lehighton.
21. The Installation and Test of an Inter-Pole Generator.
    JEROME EDWARD FISHEL, Washington, D. C.
    FREDERICK WILLIAM MAUE, Hazleton.
22. Investigation of the Operation and Characteristics of a Double-Current Electric Generator.
    WILLIAM OSCAR HAY, JR., Easton.
    WARREN WOODWARD LABARR, Winwood.
23. Electricity in Slate Quarries.
    WILLIAM EVAN LLOYD, JR., Bangor.
    RUSSELL HENRY WOLBACH, Easton.

THE ALUMNI ASSOCIATIONS.

The Alumni Association is composed of graduates of the College and such former students as left College before graduation, in good standing, as may be elected. The annual meeting is held on Tuesday, preceding Commencement Day.

The Association has the privilege of choosing, every alternate year, two members of the Board of Trustees, who hold office for six years. In June, 1912, Emery J. Kerrick, '91, of Germantown, and William A. May, '76, of Scranton, were chosen. In the Spring of 1914 two more will be voted for.

The Executive Committee is as follows: McCluney Radcliffe, M.D., '77, Chairman, Philadelphia; Robert F. Whitmer, '85, Philadelphia; Fred R. Drake, '86, Easton; James W. Fox, '88, Easton; J. F. Valieant, '99, New York, N. Y.; J. M. Porter, '86, Easton; Victor P. Wierman, '76, Trenton, N. J.; Thomas Fisher, '88, Philadelphia; George W. W. Porter, '85, Newark, N. J.

It is desirable to keep up the full record, so long maintained, of the residences, occupations, literary efforts, and public services of the alumni and former students of the College.

Information is solicited in regard to these points, and also in reference to matters appropriate to the obituary record, which is annually prepared for the alumni association.

Each alumnus is asked to send his personal record, carefully revised to date, to the secretary before May 1, 1914.

LOCAL ASSOCIATIONS.

ALUMNI ASSOCIATION OF LAFAYETTE.

A. C. **Campbell**, '84, Wilkes-Barre	*President*
Rush N. **Harry**, '89, Cincinnati, Ohio	*Vice-President*
Rev. J. F. **Stonecipher**, D.D., '74, Easton	*Sec. and Treasurer*

THE LAFAYETTE ALUMNI ASSOCIATION OF NORTH-EASTERN PENNSYLVANIA.

Harry S. **Robinson**, '89, Scranton	*President*
Oscar J. **Harvey**, '71, Wilkes-Barre	*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF PHILADELPHIA AND VICINITY.

Emery J. **Kerrick**, '91, Germantown	*President*
Charles B. **Adamson**, '77, 222 Walnut St., Phila	*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF NEW YORK AND VICINITY.

John W. **Griggs**, '68, Paterson, N. J	*President*
John F. **Valieant**, '99, 165 Broadway, New York, N. Y	*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF THE WEST BRANCH.

Fred H. **Payne**, '88, Williamsport	*President*
R. **Fleming Allen**, '90, Williamsport	*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF CENTRAL PENNSYLVANIA.

REV. A. N. HAGERTY, '81, Carlisle.................... *President*
WILLIAM H. ERNEST, '97, 3rd and Market Sts., Harrisburg. *Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF WESTERN PENNSYLVANIA.

CHAUNCEY LOBINGER, '96, Pittsburgh.................. *President*
A. WILSON MCCANDLESS, '06, Frick Bldg. Annex, Pittsburgh.................................... *Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF CHICAGO AND VICINITY.

NATHAN GRIER MOORE, '73, Chicago, Ill................ *President*
TRACY D. LUCCOCK, '05, 801 Manhattan Bl., Chicago, Ill.. *Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF WASHINGTON, BALTIMORE AND VICINITY.

WALTER B. GUY, '05, Washington, D. C................ *President*
ELI SWAVELY, '96, 4101 Connecticut Ave., Washington, D. C.. *Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF NEW JERSEY.

WAYNE DUMONT, '92, Paterson, N. J................... *President*
FREDERICK F. KENNEDY, '98, 774 Broad Street, Newark, N. J.. *Secretary*

STUDENTS.

GRADUATE STUDENTS.

S. B. Gilhuly, A.M., N. J.	History and English Literature,	Lafayette, '86.
J. B. Hench, A.M., Pa.	Latin	Lafayette, '83.
William H. Kirkpatrick, A.B., Pa.	History and Political Science,	Lafayette, '05.
Carmon Ross, Ph.B., Pa.	Modern Languages,	Lafayette, '05.
John Royden Hess, Ph.B., Pa.	Chemistry,	Lafayette, '07.
John Cawley, B.S., Pa.	Mathematics and Astronomy,	Lafayette, '10.
David W. Phillips, A.B., Pa.	English and Pedagogy,	Lafayette, '05.
Harold John Lockwood, E.E., Pa.	Physics,	Lafayette, '12.
Harold Dumont Beatty, A.B., Pa.	History and English,	Lafayette, '12.
Atcheson Laughlin Hench, A.B., Pa.	History and English,	Lafayette, '12.
Ziba Raymond Howell, Ph.B., N. Y.	Physics,	Lafayette, '07.

Graduates..11

SENIOR CLASS, 1914.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Claude Mark Albert	M.E.	Pen Argyl	33 S.
Walter DeWitt Barker	L.	Matawan, N. J.	10 S.
William Raymond Bender	C.	East Bangor	1809 Ferry
Pierson Booth	C.E.	Middletown, N. Y.	66 B.
Ralph Fitch Brown	C.E.	Honesdale	145 P.
Edmund Hance Carhart, Jr.	L.	Belvidere, N. J.	Z Ψ
Theodore Williams Chandler	Ch.	Scranton	33 S.
Edward Granville Chesley	L.	Haverhill, Mass	X Φ
John Wellington Cleaver	L.	Danville	137 F.
Earl Vincent Cline	C.	Williamsport	151 P.
Stanley Howard Cline	E.M.	Phillipsburg, N. J.,	Home, R. D. No. 2
John Riegel Clymer	E.E.	Riegelsville	Θ Δ X
Kenneth Hendrick Colville	C.E.	Carbondale	15 S.
Charles Walter Conde	C.E.	High Bridge, N. J.	1440 Washington
James Ray Conrad	C.E.	Reading	33 S.
Joseph Watson Craft, Jr.	G.S.	Ambler	140 F.
Spencer Danby	C.E.	Easton	Wayne Ave.
Gilbert Lane Dannehower	M.E.	Norristown	Φ K Ψ
Allan Palmer Darlington	M.E.	West Chester	Δ K E
Vergil Alvin Davison	E.E.	Easton	Prof. Davison's
John Munson Doremus	C.E.	Gladstone, N. J.	29 S.
Gershom Porter Ellis	E.E.	Avoca	Δ Υ
Solon John Fegely	C.	Mertztown	88 N.
William Edward Fitzgerald	C.E.	Trenton, N. J.	75 K.
William Ward Frick	M.E.	Pittsburgh	Φ K Ψ
Frederick Conrad Gamsu	C.E.	Arverne, L. I., N. Y.,	50 No. 9th
Earl DuTot Gardner	L.	Easton	808 Northampton
William Gould Gould	E.M.	Easton	746 Washington
John Summerfield Green, Jr.	G.S.	Gittings, Md.	70 B.

Name.	Course of Study.	Residence.	Room.
Milton Conrad Ham	L.	Millbrook, N. Y.	127 M.
Harold Pauli Heil	C.E.	Easton	106 Cattell
William Albert Herr	L.	Hazleton	113 McK.
Horace Kratz Hiestand	L.	Palm	161 E.
William Rodney Holbert	L.	Warrington	70 B.
James Walter Hollenbach	Ch.	Reading	127 M.
Robert Volk Keihner	L.	Collingswood, N. J.	36 S.
Gordon Arnold Kelly†	Ch.	Easton	128 No. 2d
Raymond Anthony Ketchledge	C.	Easton	1113 Washington
John Carl Kielman	M.E.	Portsmouth, Ohio,	Prof. Hardy's
Thomas Lester Killough	L.	Elizabeth, N. J.	50 S.
John Knight	C.E.	Summit, N. J.	45 S.
Frederick Louis Kolb	E.E.	Scranton	89 N.
Clarence Albert Kresge	L.	Scranton	113 McK.
Harold Samuel Laird	C.	West Chester	Prof. Youngman's
Russell Keller Laros	E.E.	Easton	410 Porter
Douglas Perkins Lawall	L.	Easton	69 No. 2d
Benjamin Lewis	C.E.	New York, N. Y.	67 B.
John Roland Lounsberry	G.S.	Branchport, N. Y.,	614 Coleman
LeRoy Gilbert Lugar	L.	Ashbourne	601 High
Robert Chesebrough McCorkle	G.S.	New York, N. Y.	Φ Κ Ψ
Thomas Francis McDonald, Jr.	L.	Stroudsburg	44 S.
David Burrell McWilliams	C.E.	Mifflinburg	115 McK.
John Wesley Magee	E.E.	Easton	Meixsell and Pierce
John William Mann	L.	Stockertown	Φ Δ Θ
James Anderson Mason	C.	Toms River, N. J.	Δ Κ Ε
Edward Dodd Mead	Ch.	Newark, N. J.	Δ Κ Ε
Francis Kinsey Metzgar	C.E.	Phillipsburg, N. J.	Home 71 Bennett
Fred Nathan Miller	C.	Easton	414 McC.
Russell Cline Miller	C.	Phillipsburg, N. J.	Home R. D. No. 2
Hobart Condit Mitchell	E.E.	Newark, N. J.	105 McK.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
William Augustave Moore	L.	Trenton, N. J.	Φ Δ Θ
Charles Conyngham Morgan	L.	Wilkes-Barre	137 F.
Peter John Naher	Ch.	Scranton	144 P.
David Paul	L.	Maghera, County Derry, Ireland,	37 S.
Chester Gordon Peck	Ch.	Perth Amboy, N. J.	Φ Δ Θ
John Pfromm	Ch.	Hazleton	51 S.
Roger Prosser	L.	Minersville	90 N.
William Clarence Pryce	C.	Ebensburg	149 P.
Robert Leon Rankin	L.	Berlin, N. J.	61 B.
Frank Joseph Reiser	L.	Hollidaysburg	148 P.
James Thompson Reside	C.E.	Salem, N. J.	99 McK.
Lewis Robbin	L.	Steelton	235 McC.
Joseph Seitz Rodenbough	L.	Easton	410 Clinton
Johnston Wilbur Roling	L.	Easton	900 Butler
James Hiatt Salmon	C.E.	Clarks Green	108 McK.
Charles Abram Secor	C.E.	Arlington, N. J.	34 S.
Abraham Jacob Segal	L.	Scranton	6 S.
John Morris Shimer	E.E.	Easton	812 Ferry
Burton Sturdevant Shupp	L.	Wilkes-Barre	28 S.
Moses Hiles Simmons	E.E.	Hamburg, N. J.	66 B.
Vincent Robinson Smith	L.	Scottdale	Θ Δ Χ
Ward Mahlon Snyder	L.	Easton	244 Bushkill
John Lang Speer	G.S.	Vandergrift	Χ Φ
Carl Caskey Speidel	L.	Washington, D. C.	109 McK.
Frederick Hiram Spotts	C.	Williamsport	128 M.
Frederick Josiah Spry	C.E.	Kingston	Brd
William Grant Taggart	C.E.	Fracksville	78 K.
Walter Walton Thompson	E.E.	Baltimore, Md.	147 P.
Roger Lockwood Totten	L.	Jersey City, N. J.	109 McK.
Thomas Wayne Trembath	L.	Kingston	28 S.
William Wagenhurst	M.E.	Norristown	Δ Κ Ε
Earnest Charles Watson	L.	Columbus, Ohio	146 P.
Andrew Young	L.	Irvington, N. J.	105 McK.

SENIORS.......................................93

JUNIOR CLASS, 1915.

Name.	Course of Study.	Residence.	Room.
Stuart Welsh Adler	L	Passaic, N. J	133 M.
William Ruthrauff Amberson	L	Waynesboro	71 B.
Edgar Maurer Anderson, Jr.	C.E.	Jersey City, N. J	Δ Υ
Harold William Anderson†	Ch	Paterson, N. J	91 McK.
William Ross Andre	L	Stroudsburg	43 S.
Harold Wilbur Bailey	E.E.	Milburn, N. J	85 N.
Andrew Gustave Bisset	C.E.	Washington, D. C	11 S.
Charles Sherwood Boyce	C.E.	Binghamton, N. Y	Φ Κ Ψ
Edwin Douglas Boyce	C.E.	Binghamton, N. Y	Φ Κ Ψ
Edward Daniel Brannon	C	Hazleton	50 S.
George Garwood Brown	G.S.	Lakewood, N. J	134 M.
Wilbur Aaron Bryan	L	Hackettstown, N. J	72 B.
Richard Griffith Burn	L	Oxford	150 P.
Paul Leo Clugston	L	Waynesboro	106 McK.
David Rhea Coffman	C	Scotland	35 S.
William Hazel Collins	E.M.	Washington, D. C	Χ Φ
Howard Strong Conklin, Jr.	E.E.	Patchogue, N. Y	Δ Υ
Donald Otto Coughlin	L	Luzerne	86 N.
Lester Marshall Curtiss	Ch	Norfolk, Conn	Σ Χ
Frederick King Davidson	Ch	Boonton, N. J	129 M.
Merrill Boswell Davis	L	Boonton, N. J	81 N.
Dwight Moody Decker	Ch	West Pittston	Δ Υ
Joseph Ignatius Diamond	G.S.	Cynwyd	Δ Υ
William Lukens Edwards	C.E.	Lansdale	163 E.
John James Egan, Jr.	L	Trenton, N. J	86 N.
Robert Edmonston Ellis	M.E.	Paterson, N. J	115 McK.
William Johnson English, Jr.	E.E.	Ocean Grove, N. J	45 S.
Frank Arthur Ernst	C.E.	Hoboken, N. J	Δ Υ
Robert Jacobs Eshleman	Ch	Berwick	1205 Washington
Charles Clark Evans	G.S.	Berwick	Φ Δ Θ
Stanley Richards Evans	C	Moosic	131 M.

Name.	Course of Study.	Residence.	Room.
Henry Rudolph Finger	L.	Wilkes-Barre	Σ Χ
George Swift Freeman	G.S.	Easton	501 Lafayette
Theodore Freeman	L.	Easton	501 Lafayette
Edgar Miller Furry	G.S.	Altoona	Χ Φ
John Henry Gaffin	C.E.	Wyoming, N. Y.	—
Wilson Baughman Gaither	L.	Greensburg	Δ Κ Ε
Dudley Able Giberson	L.	Easton	246 Bushkill
Gerald Garner Grant	M.E.	New York, N. Y.	Δ Υ
Vaughan Hatfield Griffith	L.	Rutherford, N. J.	Φ Κ Ψ
Martin Thomas Hagerty, Jr.	G.S.	Phillipsburg, N. J.,	Home Fairview Heights
Edgar Thomas Hammer	L.	Greensburg	Φ Δ Θ
Howard Hanks	C.E.	Ridgewood, N. J.	Χ Φ
Harvey Taylor Harrison	G.S.	Pittsburgh	Χ Φ
Emory Wilbur Helfrich	G. S.	Pleasantville, N. J.	Χ Φ
Jules Joseph Herbert	G. S.	Detroit, Mich.	—
James Monroe Hess, Jr.	L.	East Mauch Chunk	79 N.
Randall Francis Holden	C.E.	Washington, D. C.	87 N.
Charles Wood Horr	L.	Newark, N. J.	Θ Δ Χ
Alfred Lobb Jeffery	C.	Pen Argyl	116 McK.
Harold West Johnson	C.E.	Sparrowbush, N. Y.	81 N.
William Harrison Johnston	C.	Philadelphia	35 S.
Harry Edward Jones	C.E.	Waterbury, Conn.	39 S.
Alexander Weikel Jordan	E.M.	Easton	1055 Butler
William George Keat	M.E.	Pen Argyl	122 McK.
James Henry Kennedy	E.E.	Lansdowne	85 N.
John R. Kenyon	C.E.	Binghamton, N. Y.	Φ Κ Ψ
Joseph Homet Kerrick	E.E.	Germantown	135 F.
Walton Barr Killough	E.E.	Elizabeth, N. J.	48 S.
Harold Custer Kressler	M.E.	Bangor	—
George Washington Krick	C.E.	Richmond Hill, N. Y.	Χ Φ
Nelson David Langenbach	Ch.	Easton	R. D. No. 2
Gordon Lee	L.	Carbondale	99 McK.
Paul Morley Lee	E.E.	Middletown, N. Y.	78 K.
LeRoy Lefferson	E.E.	Manasquan, N. J.	Ζ Ψ
Horace Algert Lehr	C.	Easton	1144 Butler

Name.	Course of Study.	Residence.	Room.
John Swivel Leister	C.E.	Reedsville	11 S.
Grover Cleveland Lesser	E.M.	Upper Lehigh	314 McC.
Arthur Jefferson Lockard	Ch	Easton	102 Cattell
Charles Raymond Lohman	E.E.	Kingston	80 N.
William Henry McCutcheon, Jr.	L	Wayne	Φ Δ Θ
Robert Dallas McManigal	E.E.	Logan, Ohio	80 N.
Warren Bryan Mack	L	Flicksville	637 High
Walter Seeley Mallory, Jr.	Ch	Easton	Θ Δ X
Edward John Fox Marx	L	Easton	8 Chestnut Terrace
John Maxwell	C	Easton	612 Cattell
Otto May	L	Pittsburgh	68 B.
Arthur Leon Meyer	Ch	Trenton, N. J.	Φ Δ Θ
Carl Nicholas Miller, Jr.	Ch	Bangor	75 K.
George Roland Miller, Jr.	C	Easton	323 High
William McKee Moffat	C	Fort Wayne, Ind.	136 F.
John Heiks Paul	M.E.	New Kingston	121 McK.
William Hunter Powell	E.E.	Wyncote	Z Ψ
Lewis Matten Prutzman	L	Hamburg	16 S.
Shipman Roseberry Pursel	C.E.	Phillipsburg, N. J.	Home, R. D.
Barron Peard Rex	L	Rumson, N. J.	Brd.
Jules Darius Roberts, Jr.	M.E.	Dallas, Texas	76 K.
Roy Thomas Robling	C	Moosic	Brd.
Carl Fawcett Scharpf	L	Coraopolis	Δ Υ
Ralph Andrew Schilling	E.M.	Easton	208 No. 7th
Arthur Anders Schultz	Ch	Norristown	134 M.
Walter James Scott	L	Collingswood, N. J.	116 McK.
Frank Jacob Seibert	Ch	Easton	640 Wolf
Ralph Faust Shaner	L	Pottstown	36 So.
Paul Colver Shoemaker	Ch	Allentown	Φ Δ Θ
Harold William Sloyer	Ch	Easton	R. D. No. 6
Ernest Elwin Smith	E.E.	Lehighton	165 E.
Foster Byron Snowden	L	Conemaugh	139 F.
Robert Smith Soles	E.E.	McKeesport	Φ K Ψ
Paul Virchow Speer	G.S.	Vandergrift	X Φ
William Joel Spry	L	Plymouth	122 McK.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Millard Fillmore Staples	C	Stroudsburg	Χ Φ
Thomas Findley Steele	C.E.	Shamokin	—
Benjamin Cornell Stevens	L	Wyalusing	118 McK.
Frank Marshall Sweeny	C.E.	Baltimore, Md.	89 N.
William Perry Tallman	L	Phillipsburg, N. J.,	Home, 35 Bullman
Lewis Grant Teetsell	Ch	Tarrytown, N. Y.	Δ Υ
James Donohoe Toole	L	Minersville	90 N.
Lyman Charac VanInwegen	E.E.	Hugenot, N. Y.	129 M.
George Willever Walton	L	Berwick,	9 Sitgreaves, Phillipsburg, N. J.
James Jamison Waygood	L	Oak Lane	Φ Δ Θ
Cornelius Lane Wells	G.S.	Wayne	Ζ Ψ
Lea Danenhower Williams	G.S.	Washington, D. C.	Χ Φ
Russell Stanley Woglom	L	Perth Amboy, N. J	49 S.
Gilbert Allan Woods	Ch	Easton	Chestnut and Cattell
Willard Wright	L	Worcester, N. Y.	43 McC.

JUNIORS..116

SOPHOMORE CLASS, 1916.

Name.	Course of Study.	Residence.	Room.
John Quincy Adams	C.E.	Easton	819 Spring Garden
George Lenher Alexander	Ch.	Everett	69 B.
Karl Janeway Ammerman	M.E.	Scranton	Δ Υ
Ross Quay Augustine	L.	Uniontown	Θ Δ Χ
John Watts Baer Bausman, Jr.	G.S.	Lancaster	Δ Κ Ε
Joseph Shakespeare Beddall	Ch.	Tamaqua	27 S.
John Winfield Bennett	L.	Patchogue, N. Y.	82 N.
Albert Beyer, Jr.	E.E.	Atlantic City, N. J.	—
Harvey MacKnight Black	C.	Easton	129 Pierce
Daniel McMichael Blackburn	M.E.	Easton	807 Wood
Roger Hunt Blake	C.	Trenton, N. J.	—
Wendell Spencer Brearley	C.	Bradley Beach, N. J.	94 McK.
Earl Andrew Brinker	Ch.	Easton	415 High
Clarence Jenkins Brown	L.	Lakewood, N. J.	144 P.
Hugh Jackson Bubb	G.S.	Williamsport	Δ Κ Ε
Richard Cameron Cain	Ch.	Berwick	136 McC.
Thomas Derby Carey	L.	Moosic	72 B.
Harold Frederick Carter	G.S.	Norfolk, Ct.	12 S.
Charles Samuel Clark	C.E.	Binghamton, N. Y.	152 P.
Robert Nesbitt Clark	L.	Wilkes-Barre	97 McK.
C. Marshall Cochran	Ch.	West Chester	145 P.
George Nathaniel Cohen	C.E.	Washington, D. C.	609 High
Floyd Hoff Compton	M.E.	Springtown, N. J.	Home
William Mead Cornwell	E.E.	Blairstown, N. J.	Φ Δ Θ
Carl McMaster Crawford	C.	Indiana	Φ Κ Ψ
Emerson DelRoy Creveling	G.S.	Brooklyn, N. Y.	Δ Υ
Robert Watkins Davies	L.	Easton	——
William Eugene Delaney, Jr.	L.	Williamsport	Χ Φ
John Patrick Diamond	C.E.	Cynwyd	Δ Υ
Theodore Mulford Doan	G.S.	Berwick	138 F.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Colin Tolmie Dodd	G.S.	Phillipsburg, N. J.,	Home, 32 Chambers
Warren Gore Donaldson, Jr.	Ch.	Trenton, N. J	Φ Δ Θ
John Earle Donmoyer	G.S.	Lebanon	Δ Υ
Sydney Fetherman Downs	M.E.	Easton	128 Parsons
Frederick Drexel	C.E.	Brooklyn, N. Y	231 Cattell
Alfred Hall Drummond	E.E.	Nanking, China	167 E.
John Hannaniah Dyer	L.	Scranton	108 McK.
Horatio Spencer Edmunds	L.	St. Louis, Mo	Φ Δ Θ
Lloyd McPherson Felmly	L.	Phillipsburg, N. J.,	Home, 5 Front
Harold Davies Fernau	L.	Jeddo	140 F.
Samuel Brown Fleming†	C.E.	Easton	—
Willis Austin Flory	M.E.	Bangor	130 M.
Ralph Sprague Ford	L.	Richmond, Ohio	132 Cattell
Clarence Welch Forshee	G.S.	Glenwood, N. J	Φ Δ Θ
Philip Frederick Forve	G.S.	Los Angeles, Cal	Ζ Ψ
Harry LaTourette Foster	L.	Brooklyn, N. Y	88 N.
Louis Rodman Fox	E.E.	Easton	Ζ Ψ
Sylvio de Campos Freire	C.E.	Sao Paulo, Brazil	611 High
Russell Harrison Fritz	M.E.	High Bridge, N. J	Home
James Russell Gardner	C.E.	Scranton	Δ Υ
William Harold Garis	C.E.	Phillipsburg, N. J	——
William Joseph Gaynor	L.	Phillipsburg, N. J.,	Home, 76 Fayette
William Reading Gebhardt	L.	Clinton, N. J	38 S.
Frederick Augustus Glisencamp	L.	Mount Tabor, N. J	40 S.
Harman Reasoner Goldthwaite†	G.S.	Marion, Ind	Ζ Ψ
Walter Berton Grigsby	C.E.	Washington, D. C,	102 McK.
Joachim Isaac Gulick	L.	White House Station, N. J.	132 Cattell
Frank Sharp Hammond	M.E.	Coatesville	77 K.
Herbert Newlin Hartman	L.	Wilmington, Del	94 McK.
Mathias Saxman Hartman	G.S.	Latrobe	139 F.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Harry Cyphers Hartung	E.E.	Phillipsburg, N. J., Home,	47 Washington
Francis Ogden Hathaway	L.	Deposit, N. Y	63 B.
Harry Roosevelt Heins	L.	Cranford, N. J	98 McK.
Philip Showalter Hench	C.	Pittsburgh	142 P.
Ray DeWitt Herring	C.	Pen Argyl	37 S.
Christian Aaron Hess	Ch.	Stroudsburg	Knox St.
Alexander Christy Hobson	L.	Philadelphia	34 S.
Bernard Sol. Hoffenstein	L.	Wilkes-Barre	609 High
Paul Hacke Hugus	L.	Latrobe	Φ K Ψ
Frederick Blackburn Hunt	E.E.	Trenton, N. J	65 B.
John Rexroth Irwin	L.	McConnellsburg	69 B.
Homer Miller Jacobs	L.	Pottstown	132 Cattell
Sedgwick Kistler Johnson	Ch.	Easton	114 McK.
Harry Melick Keller	Ch.	Stroudsburg	83 N.
Frank Boone Kelly	E.E.	Pitman, N. J	711 High
Charles Langdon Kennedy	L.	New York, N. Y	230 McC.
Elmer Walton Kirk, Jr	C.E.	Doylestown	Φ Δ Θ
William Irwin Kocher	L.	Easton	R. D. No. 2
Russell Stewart Kramer	E.E.	Easton	724 Coleman
Kenneth Wolfinger Kressler	L.	Easton	13th and Butler
John Raymond Kuechel	C.E.	Elizabeth, N. J	150 P.
Paul Angier Laird	Ch.	West Chester	Prof. Youngman's
John Curry Lee	M.E.	Pottsville	Θ Δ X
Adie Cloyd Leonard	L.	Hollidaysburg	635 High
Claude Brinser Lerch	L.	Highspire	Δ Υ
Bennett Moorhead Livezey	Ch.	Doylestown	Φ K Ψ
Jacob Livingston	G.S.	Dover, N. J	117 McK.
Solomon Livingston	G.S.	Dover, N. J	117 McK.
Richard Bennett Lloyd	C.E.	Washington, D. C	X Φ
Richard Whitney Logan	M.E.	Scranton	74 K.
Robert Lee Logan	L.	Philadelphia	42 S.
John Frederick Luhr	M.E.	Roselle Park, N. J	Δ K E
Lawrence Thomas McCormick	C.E.	Belmar, N. J	130 McC.
Francis Andrew March	C.E.	Harrisburg	Δ K E

Name.	Course of Study.	Residence.	Room
William Leo Matthes	M.E.	Phillipsburg, N. J., Home,	99 Sitgreaves
Guy Edmund Mauser	Ch.	Catasauqua	27 S.
Kenneth Alston Maxwell	L.	Meadowbrook, N. Y.,	101 McK.
Joseph Mayer	L.	Easton	41 So. 10th
William Cassedy Mecray	G.S.	Cape May City, N. J.	37 S.
Norman William Miller	Ch.	Washington, D. C.	102 McK.
Charles Byron Morgan†	G.S.	Wilkes-Barre	Ζ Ψ
Gerald Amos Morgan	C.E.	Harrisburg	Φ Δ Θ
Leon Newpher Morgan	C.E.	Harrisburg	Φ Δ Θ
Harold Mumma	E.E.	Steelton	Φ Δ Θ
Frank Maurice Murphy	L.	Greensburg	132 Cattell
Milton Kendall Myers	Ch.	Washington, D. C.	87 N.
Harry Campbell Neely	C.	Woodbine	230 McC.
James Hance Neighbour, Jr.	C.E.	Dover, N. J.	Φ Κ Ψ
Harold Herman Offutt	Ch.	Washington, D. C.	635 High
Willard Thomas O'Hara	L.	Phillipsburg, N. J.	—
John Secrist Oller	L.	Waynesboro	101 McK.
Norman Kethlege Pearson	C.E.	Flicksville	Home
Daniel James Perry	E.E.	Easton	137 So. 13th
Elbert B. Pickell	Ch.	Whitehouse, N. J.	155 E.
Edward Arthur Pitcher	C.E.	Dover, N. J.	Φ Κ Ψ
Willard Averell Pollard, Jr.	C.E.	Washington, D. C.	92 McK.
George William Porter	L.	Greensburg	—
Thomas Bancroft Reifsnyder	L.	East Orange, N. J.	47 S.
William Franklin Remaly	C.E.	Easton	409 High
Chauncey Hoffman Ribble	E.E.	Washington, N. J.	23 S.
George James Richards	C.E.	Wilkes-Barre	42 S.
Cecil Blair Rogers	L.	Sugar Run	61 B.
Ross Wadsworth Rohn	L.	Sussex, N. J.	169 E.
Herbert Knapp Rollins	E.M.	New York, N. Y.	314 McC.
Jacon Bergen Rue, Jr	G.S.	Red Bank, N. J.	Δ Κ Ε
David Mohler Rupp	C.	Shiremanstown	62 B.
Fritz Scheeren	L.	Ford City	Χ Φ
Frank Huff Schlough	E.E.	Easton	109 Orchard

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Fred Calvin Shotwell	L.	Phillipsburg, N. J.,	Home, R. D.
Monroe Wilson Sloyer	L.	Easton	R. D. No. 2
Earl Russell Smith	E.E.	Easton	1091 Berwick
Henry Jacob Smith	L.	New Oxford	16 S.
Lewis Aaron Smith	C.	Easton	R. D. No. 2
Harold Van Allen Stewart	Ch.	Quakake	130 McC.
Samuel Biffert Stilwell	L.	Doylestown	62 B.
John Norwood Stipe	L.	Easton	13th and Bushkill
Leon Stansfield Stone	L.	Newton, N. J	128 M.
Russell Bennett Stone	L.	Easton	476 Nesquehoning
Herbert Russ Storr†	G.S.	Easton	501 Reeder
Guy Holden Stoutenburgh	G.S.	Far Hills, N. J	Φ K Ψ
Charles Xavier Thomas	G.S.	Freeland	148 P.
Henry Huston Thomas	L.	Franklin	147 P.
Oscar Saul Tischler	L.	Wilkes-Barre	6 S.
Henry Moffett Tonkin	E.M.	Millington, Md.	711 High
James Lilly Trowbridge	C.	Easton	301 Cattell
George Brinton McClellan Troxell	Ch.	Easton	Charles and Madison
Richard Britton Unangst	Ch.	Wilkes-Barre	230 McC.
Charles Reinhart Wackenhuth	L.	Picture Rocks	91 McK.
Frank Frederick Weaver	Ch.	Easton	18th and Butler
James Holman Weir	E.E.	Natalie	—
Edward Welles, Jr	G.S.	Wilkes-Barre	3 S.
Charles Stevenson Wheeler	L.	Newville	130 McC.
Thomas Arthur Williams	L.	Fullerton	143 P.
Joseph Gilliard Williamson	Ch.	Bloomsbury, N. J	Home
William Henry Wilson	C.E.	Perth Amboy, N. J	24 S.
Edwin Willard Woehling	C.E.	East Orange, N. J	65 B.
William Irwin Woodcock, Jr.	L.	Hollidaysburg	Φ K Ψ
Clark Ellis Woodring	E.E.	Hazleton	24 S.
Archie Scott Woods	M.E.	Easton	Chestnut and Cattell
Harold John Woodward	E.E.	Cookstown, N. J	135 F.
Russell Holcombe Wyckoff	C.E.	Flemington, N. J	23 S.
James Simpson Young	L.	Wood Ridge, N. J	100 McK.

SOPHOMORES 162

FRESHMAN CLASS, 1917.

Name.	Course of Study.	Residence.	Room.
David Bowman Adler	L.	Passaic, N. J.	146 P.
Jay Warren Angle, Jr.	L.	Hot Springs, Ark.	110 McK.
Irving LaFétra Arbeely	C.	Oakton or Vienna, Va., R. F. D.	92 McK.
Miers Seler Backenstoe	L.	Emaus	130 M.
Robert Earle Bacon	L.	Bridgeton, N. J.	Δ Υ
Edwin Rockerfeller Baldrige	E.E.	Hollidaysburg	77 K.
Irenaeus Prime Bartley	M.E.	Bartley, N. J.	Z Ψ
Arthur Hallmeyer Becker	E.E.	Kulpsville	601 High
William Clair Behney	L.	Lebanon	611 High
Joseph Ellsworth Beideman	G.S.	Norristown	232 McC.
William Stanley Bell	C.E.	Cranford, N. J.	98 McK.
Frederick William Biltz	C.E.	Ashland	82 N.
Kenneth Merry Bixler	L.	Easton	206 Spring Garden
Paul Morse Blackburn	Ch.	Greensburg	—
Herrmann Ludwig Blumgart	G.S.	Newark, N. J.	41 S.
Norman Conyers Bradish	G.S.	Decorah, Iowa	Φ K Ψ
Frederick Leo Brannon	L.	Hazleton	51 S.
Lansford Brett	G.S.	Easton	908 Paxinosa Ave.
John Shaffer Brobst	G.S.	Allentown	136 McC.
Roland Wilbur Brown	G.S.	Aquashiocla	168 E.
Charles Clare Brownmiller	L.	Shoemakersville	701 High
Isaac Reily Bucher	G.S.	Lebanon	701 High
Albert Asher Burros	L.	Scranton	—
Wilson Earl Caffey	C.E.	Phillipsburg, N. J.	Home, 212 Mercer
John Neldon Carter	E.M.	Easton	308 No. 10th
Lloyd Raymond Cherry	G.S.	Phillipsburg, N. J.	—
Francis Arndt Chidsey	Ch.	Easton	133 Bushkill
John Teasdale Clark	G.S.	Wilkes-Barre	97 McK.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Heston Rarick Cole	C.E.	Succasunna, N. J.,	229 Mercer, Phillipsburg, N. J.
Earle Johnston Conover	L.	South River, N. J.	176 E.
Cecil Harold Couch	C.E.	Hampton, N. J.	—
Harold Alanson Crane	L.	Phillipsburg, N. J.,	Home, 101 So. Main
Ralph Worthington Crane	L.	South Amboy, N. J.,	Cattell & High
Benjamin George Dann	C.E.	Beltsville, Md.	212 McC.
Everett Kelsey Davey	C.E.	Rockaway, N. J.	Δ Υ
George Lewis Davis	G.S.	Ben Avon	Χ Φ
Palmer Crevier Dawson	L.	Boonton, N. J.	Δ Υ
Pardee F. Day	L.	Hazleton	Θ Δ Χ
Louis Leon deSalignac	C.E.	Pompton Lakes, N. J.,	93 McK.
Paul Elliott Dodson	L.	Wilkes-Barre	206 McC.
John Edward Doheny	C.E.	Haverford	Δ Υ
Frank Thomas Donahue	L.	Roxbury, Mass.	Cattell
George Howard Drake	M.E.	Easton	927 Northampton
Robert Leslie Dunlap	E.E.	Easton	1032 Lehigh
Vinn C. Edminster	G.S.	San Francisco, Cal.	Χ Φ
Arthur Serfass Eichlin	Ch.	Easton	1627 Northampton
Joseph Raymond Evans	L.	Washington, N. J.	151 P.
Joshua Grover Everard	L.	Wapwallopen	130 McC.
Edwin Grone Eyerly	L.	Danville	107 McK.
Robert Arthur Farnam	C.E.	LaCrosse, Wis.	Δ Κ Ε
John Edmund Fasick	L.	Altoona	76 K.
Harrison Robert Fehr, Jr.	E.E.	Allentown	Δ Κ Ε
Joseph Fitts	Ch.	Newark, N. J.	Σ Χ
Walter Crawford Flower	L.	Passaic, N. J.	133 M.
Paul Marvin Fouts	G.S.	Mountainville, N. Y.,	95 McK.
Meyer Arthur Friedberg	E.E.	Mahanoy City	—
Arthur Stitzer Fry	E.E.	Oley	—
Gardner Gantz	G.S.	Rapid City, S. D.,	132 Cattell
William Voorhees Garretson	Ch.	Perth Amboy, N. J.	611 High

Name.	Course of Study.	Residence.	Room.
Fred Lewis Gerard	C.E.	Hampton, N. J	Home
Edwin Earle Gibboney	M.E.	Everett	——
William Elwood Gilbert	Ch.	Spring City	232 McC.
Leo Alton Gordown	L.	Phillipsburg, N. J.,	Home, 7 Heckman
Forrest LeBarre Graves	E.E.	Delaware Water Gap,	711 High
Harold Crane Griffin	E.E.	Phillipsburg, N. J.,	Home, 159 Chambers
John Edward Guiney	L.	Wilkes-Barre	——
Fred Passmore Gutelius, Jr.	C.E.	Moncton, N. B., Canada,	152 P.
Jonathan Fletcher Hagaman	E.E.	Highlands, N. J	5 S.
Alfred William Handwerk	Ch.	Siegfried	159 E.
T. Walter Hannum	Ch.	West Chester	15 S.
Benjamin Russell Harrison	E.E.	Easton	216 McC.
Jay Wilson Harrison	Ch.	Easton	210 Bushkill
Herbert Hogg Harvey	L.	Newtown	703 High
John Gordon Hay	G.S.	South Bethlehem,	Home, 841 Seneca
John Kinsey Hefferman	Ch.	Easton	256 Bushkill
Robert Leon Hefferman	C.E.	Easton	256 Bushkill
George Mathews Henry	G.S.	Lebanon	Δ Υ
Raymond Walker Hill	L.	Metal	44 S.
Floyd Hoffman	G.S.	Califon, N. J	143 P.
Carl Edwin Houck	L.	Bangor	232 McC.
Harold Brekford Hufford	Ch.	Bloomington, Ill	—
Ellis Hughes	E.E.	Slatington	431 Clinton
Samuel McCoy Hunt	E.E.	Sussex, N. J	173 E.
Russell John Hurd	C.E.	Pen Argyl	231 Cattell
Charles Heebner Ives	L.	Scranton	118 McK.
Jacob David Kabatchnick	L.	Easton	820 Paxinosa
George Denis Kane	L.	Phillipsburg, N. J.,	Home, 224 Chambers
Alex Isaac Karrakis	E.M.	Newark, N. J	—
Harold Raudenbush Keeler	L.	Harleysville	10 S.

Name.	Course of Study.	Residence.	Room.
Ronald Clyde Kelly	Ch.	Passaic, N. J.	——
Raymond Grant Kenyon	L.	Easton	732 Washington
Paul Darlington Kern	M.E.	Easton	——
Oscar Emmons Ketchledge	E.E.	Easton	——
George Wilbur Kidney	C.E.	Phillipsburg, N. J.,	Home, 377 So. Main
John Clayton Kistler	G.S.	Lansford	138 F.
Arnold George August Klosé	L.	Great Meadows, N. J.	171 E.
Howard Franklin Koons	C.E.	Perth Amboy, N. J.	611 High
Israel Krohn	G.S.	Easton	698 Northampton
Tadashi Kurimoto	C.E.	Hundu, Japan	——
William Richardson Lane	C.E.	Prospect, Tenn.	——
Robert Warne Laubach	Ch.	Northampton	Δ Υ
Miles Benton Layton, Jr.	C.E.	Pittsburgh	——
Neal Dow Lecher	E.E.	Wilkes-Barre	——
John Morgan Lee	M.E.	Kingston	Δ K E
Harper Ferguson Leeper	C.	Media	14 S.
Frank Henry Lehecka	C.E.	Easton	110 Parker Ave.
Frederick Augustus Lehmann	E.E.	Washington, D. C.	230 McC.
Stanley Matthew Leicht	G.S.	Newark, N. J.	73 K.
John Raymond Leininger	C.E.	Easton	——
Daniel Charles Lichtenwalner	Ch.	Tatamy	Home
Abraham Lipson	Ch.	Newark, N. J.	431 Clinton
Charles Edgar Lothrop	L.	Easton	East Paxinosa Ave.
Clarence Willard Lowden	L.	Delmar, Del.	319 McC.
David Lewis McAllister	M.E.	Newton, N. J.	132 M.
Joseph Alexander McCurdy	L.	Lansford	174 E.
Russell Thomas McFall	C.E.	Flicksville	100 McK.
Maxwell McKeen	L.	Easton	310 New
Philip Aloysious McNally	G.S.	Easton	215 Lafayette
Harry Alexander MacFadden, Jr.	E.E.	Hollidaysburg	Z Ψ
Carl Theodore Mack	E.E.	Easton	418 McC.
Edward Scudder Mackey	E.E.	Easton	125 Northampton
Joseph Anthony Malloy	C.E.	Trenton, N. J.	212 McC.
Francis Andrew March, III	Ch.	Easton	Prof. March's

Name.	Course of Study.	Residence.	Room.
Harold Francis Marshall	M.E.	Cranford, N. J.	509 High
Harold Franklin Mather	L.	Wilkes-Barre	136 McC.
Henry Dusenbery Maxwell, Jr.	M.E.	Easton	208 Spring Garden
Paul Heritage Mayhew	E.E.	Woodbury Heights, N. J.,	149 P.
Harry Smuller Meily, Jr.	L.	Tyrone	121 McK.
Howard George Memory	C.E.	Maplewood, N. J.	2 S.
Fred Biesecker Merring	L.	East Stroudsburg	119 McK.
Carl Sigman Middaugh	M.E.	Easton,	Burke & Paxinosa Ave.
James D. Miller, Jr.	G.S.	Binghamton, N. Y.	——
Orville Ford Andrew Miller	L.	Easton	924 Butler
Redington Moore	M.E.	Laconia, N. H.	305 New
Donald Adam Mummert	L.	Harrisburg	136 McC.
Lyman Daniel Oberlin	E.E.	Silver Springs, Md.	231 McC.
Frank William Officer	C.E.	Council Bluffs, Iowa,	107 McK.
Paul Wenrick Oliver	Ch.	York	131 M.
Herbert Jackson Otto	Ch.	Philadelphia	——
Daniel Hawkins Overton, Jr.	L.	Islip, N. Y.	48 S.
Charles Marvin Pardee	G. S.	Hazleton	Θ Δ Χ
Carl George Paulson	L.	Greensburg	Φ Δ Θ
James Preston Penfield	G.S.	New York, N. Y.	Θ Δ Χ
George Edwin Pidcock	C.E.	Bloomsbury, N. J.	Home
Stewart Hagerty Pursel	Ch.	Phillipsburg, N. J.,	Home, Fairview Place
Joseph Bradley Quig	Ch.	Delaware, N. J.	110 McK.
James Herbert Quiri	C.E.	Easton	115 McC.
Robert Quiri	L.	Easton	115 McC.
Harold Henry Rahn	C.E.	Kutztown	232 McC.
Harry Lawrence Ramage	C.E.	Florida, N. Y.	175 E.
Joseph Leo Reddan	L.	Trenton, N. J.	Φ Δ Θ
Spencer H. Reed	C.E.	Tunkhannock	——
John Coffey Reese	L.	Shippensburg	114 McK.
Samuel William Rinn	M.E.	Indiana	Φ Κ Ψ
James Brockett Roberts	G.S.	Canastota, N. Y.	43 No. 8th

Name.	Course of Study.	Residence.	Room.
John Mather Rogers	G.S.	Port Dickinson, N. Y.,	101 McC.
Louis L. Rudner	L.	Trenton, N. J.	130 McC.
John Bradley Sheffield	Ch.	Pompton Lakes, N. J.	3 S.
Herman Shepowich	L.	Wilkes-Barre	137 McC.
Warren Krechting Sherman	L.	New Germantown, N. J.,	157 E.
Charles Reed Shipman	E.E.	Phillipsburg, N. J	——
George Sellers Smith	M.E.	Latrobe	Φ Κ Ψ
Philip Charles Smith, Jr.	C.E.	Easton	Sullivan
Robert Bitner Smith	E.E.	Connellsville	330 Cattell
Sydney Griswold Smith	C.E.	Phillipsburg, N. J., Home,	97 So. Main
Earle Spader Snyder	G.S.	Atlantic Highlands, N. J.,	5 S.
John Soler	C.E.	Phillipsburg, N. J	——
Arthur Raymond Bunting Stern	C.E.	Philadelphia	162 E.
Grayson Stickell	L.	Waynesboro	106 McK.
Mortimer Menville Stocker	L.	Honesdale	164 E.
Donald Lionel Morris Strebig	L.	Boston, Mass.	——
Frederick Lester Suttle	L.	Phillipsburg, N. J., Home,	37 Chambers
Juan Torroella y Rooney	C. E.	Havana, Cuba	——
James Kerr Towers	C.E.	Newark, N. J	——
Frank Fisher Truscott	L.	East Stroudsburg	83 N.
Allen Scott Turner, Jr	E.E.	Maplewood, N. J	2 S.
William Berner Ulmer	Ch.	Pottsville	Θ Δ Χ
Carryl Stephen Vail	L.	Honesdale	230 McC.
Forrest Cecil Read Van Horn	L.	Hope, N. J	136 McC.
Ralph Leland Van Horn	C.E.	Wilkes-Barre	136 McC.
John Brennen Edward Vilsack	G.S.	Pittsburgh	Mr. Hatch's
Arthur Richard Walk	L.	Chambersburg	170 E.
Clair Maxwell Wallace	C.E.	Media	14 S.
George Charles Watson	L.	Cumberland Gap, Tenn.,	230 McC.
Roy Stodgen Weidman	M.E.	Phillipsburg, N. J	——
Hibbert Preston Wells	E.E.	Chester Springs	——

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Henry Stanley Welty	C.	Portland	173 E.
Edward Russell White	G.S.	Rutland, Vt	Z Ψ
Charles Floyd Whiteman	G.S.	Latrobe	74 K.
Stewart Means Wikel	E.E.	Marietta	43 S.
Allen Graves Williams	G.S.	Portsmouth, Ohio	Φ K Ψ
Alun Sylvanis Williams	L.	Wilkes-Barre	12 S.
Benjamin Crispin Williams	L.	Berwick	136 McC.
Jacob Benjamin Woehrle, Jr.	C.	Wilkes-Barre	1323 Liberty
Norman Howard Wolbach	E.M.	Easton	37 So. 13th
William Moodie Woodruff	E.E.	Trenton Junction, N. J.	68 B.
Emil Robert Zenke	M.E.	Scranton	X Φ
William Edward Zinn	Ch.	Easton	221 No. 10th

FRESHMEN.................................... 198

ABBREVIATIONS FOR BUILDINGS AND COURSES OF STUDY.

Brd.—Brainerd Hall.
B.—Blair Hall.
E.—East Hall.
F.—Fayerweather Hall.
K.—Knox Hall.
M.—Martien Hall.
McC.—McCartney St.
McK.—McKeen Hall.
N.—Newkirk Hall.
P.—Powell Hall.
S.—South College.
Δ K E—Fraternity House.
Σ X—Fraternity House.
Θ Δ X—Fraternity House.
Φ Δ Θ—Fraternity House.
Φ K Ψ—Fraternity House.
Z Ψ—Fraternity House.
X Φ—Fraternity House.
Δ Υ—Fraternity House.

C.—Classical.
C.E.—Civil Engineering.
Ch. Chemical.
E.E.—Electrical Engineering.
E.M.—Mining Engineering.
G.S.—General Scientific.
L.—Latin Scientific.
M.E.—Mechanical Engineering.

SUMMARY

Courses.	Seniors.	Juniors.	Sophomores.	Freshmen.	Total.
Graduates	..	..	..	..	11
Classical	10	11	10	4	35
Latin Scientific	34	36	45	46	161
Latin Scientific. Electing Greek	..	..	10	14	24
General Scientific	5	12	20	30	67
Civil Engineering	19	17	26	38	100
Electrical Engineering	10	14	16	26	66
Mining Engineering	2	4	2	3	11
Mechanical Engineering	6	6	12	14	38
Chemical	7	16	21	23	67
Totals	93	116	162	198	580

CLASSIFICATION BY RESIDENCE (Non-graduates.)

Arkansas	1	Michigan	1	Vermont	1
California	2	Missouri	1	Virginia	1
Connecticut	3	New Hampshire	1	Wisconsin	1
Delaware	2	New Jersey	146		
Dist. of Columbia	13	New York	34	Canada	1
Illinois	1	Ohio	5	China	1
Indiana	2	Pennsylvania	333	Cuba	1
Iowa	2	South Dakota	1	Ireland	1
Maryland	6	Tennessee	2	Japan	1
Massachusetts	3	Texas	1	South America	1

For further information, address "The Registrar, Lafayette College, Easton, Pennsylvania."

LH1

Vol. 9, No. 2 February, 1915

BULLETIN

OF

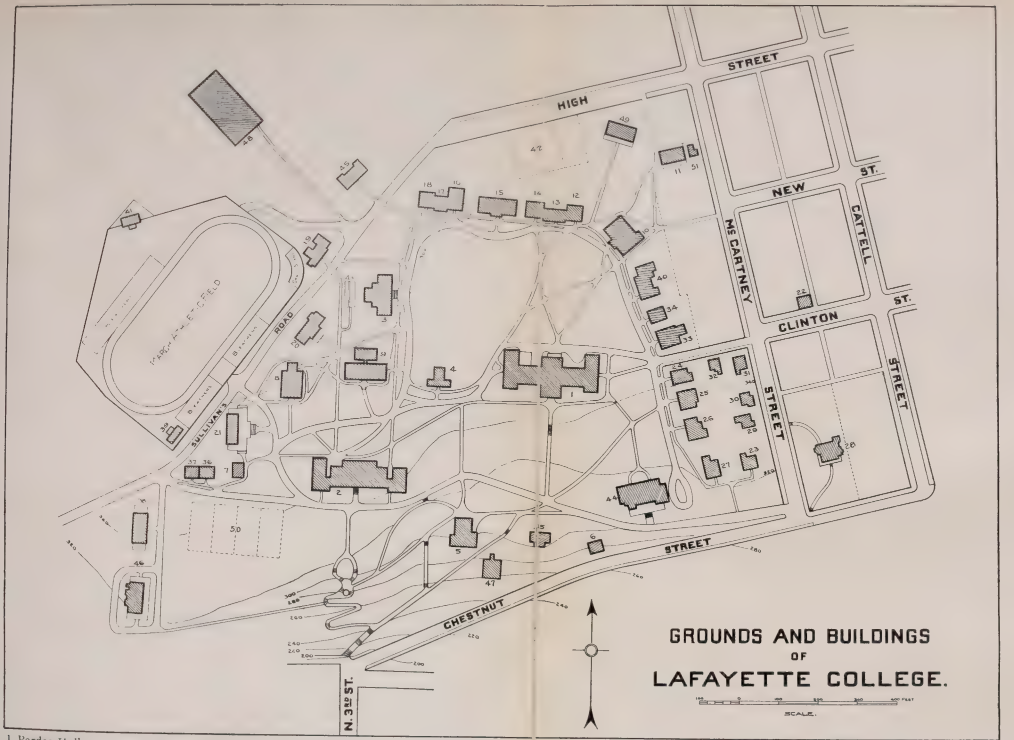
LAFAYETTE COLLEGE

GENERAL CATALOGUE
1914-1915

PUBLISHED QUARTERLY BY LAFAYETTE COLLEGE

Entered as second-class matter November 20, 1906, at Easton, Pennsylvania,
under the Act of Congress of July 16, 1894.

LAFAYETTE COLLEGE, EASTON, PENNSYLVANIA.



GROUNDS AND BUILDINGS OF LAFAYETTE COLLEGE.

1 Pardee Hall.
2 South College.
3 Gayley Hall of Chemistry.
4 Observatory.
5 Jenks Biological Laboratory.
6 Private Laboratory.
7 College Office.
8 Gymnasium.
9 Van Wickle Library
10 Brainerd Hall.
11 East Hall.
12 Powell Hall.
13 Fayerweather Hall.
14 Martien Hall.
15 McKeen Hall.
16 Newkirk Hall.
17 Knox Hall.
18 Blair Hall.
19 Delta Kappa Epsilon.
20 Phi Delta Theta.
21 Theta Delta Chi.
22 Sigma Chi.
23 Prof. Davison.
24 Prof. Youngman.
25 Prof. Hardy.
26 Prof. Hall.
27 Prof. Lyle.
28 President MacCracken.
29 Prof. Peck.
30 Prof. Owen.
31 Prof. Wysor.
32 Prof. Fehr.
33 Prof. Coffin.
34 Prof. March, Jr.
35 Prof. Hart.
36 Prof. Martin.
37 Prof. Rankin.
38 Delta Tau Delta.
39 Field House.
40 Delta Upsilon.
41 Field House.
42 Tennis Courts.
43 Greenhouse.
44 Zeta Psi.
45 Phi Kappa Psi.
46 Chi Phi.
47 Central Heating Plant.
48 Mechanical Eng. Bldg.
49 Phi Gamma Delta.
50 Tennis Courts.

2 and 11 to 18—Dormitories.

BULLETIN OF
LAFAYETTE COLLEGE

INCLUDING THE COURSES OF STUDY

IN THE

CLASSICAL *and* SCIENTIFIC DEPARTMENTS

AND THE

Departments of Civil, Mining, Electrical, and Mechanical Engineering and of Chemistry

EIGHTY-THIRD YEAR
1914-1915

EASTON, PENNSYLVANIA
1915

CONTENTS.

Absences and Re-examinations.......... 151
Admission.......... 16
Advanced Standing.......... 25
Alphabetical Subject Index.......... 32
Alumni Association.......... 192
Attendance.......... 150
Bequests and Devises.......... 180
Buildings.......... 162
Calendar.......... 6
Chemical Course.......... 87
Civil Engineering Course.......... 56
Classical Course.......... 39
College Officers.......... 15
Commencement.......... 157
Course Numbers.......... 29
Courses of Study.......... 28
Degrees.......... 158
Degrees Conferred 1914.......... 186
Dormitories.......... 166
Electrical Engineering Course.......... 73
Expenses.......... 175
Faculty.......... 9
General Scientific Course.......... 49
Graduation.......... 157
Lafayette College.......... 7
Latin Scientific Course.......... 48
Libraries.......... 169
Matriculation.......... 27
Mechanical Engineering Course.......... 80
Medical Treatment.......... 159
Mining Engineering Course.......... 65
Prizes.......... 181
Prizes Awarded 1914.......... 188
Religious Instruction.......... 160
Societies.......... 173
Students.......... 195
Terms.......... 161
Theses.......... 190
Trustees.......... 8
Vacations.......... 161
Y. M. C. A.......... 167

1914

JULY

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

AUGUST

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

SEPTEMBER

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

OCTOBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

NOVEMBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

DECEMBER

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

1915

JANUARY

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

FEBRUARY

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28						

MARCH

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

APRIL

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

MAY

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

JUNE

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

JULY

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

AUGUST

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

SEPTEMBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

OCTOBER

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

NOVEMBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

DECEMBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

1916

JANUARY

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

FEBRUARY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29				

MARCH

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

APRIL

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

MAY

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

JUNE

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

CALENDAR.

1914—Sept. 17—9.45 A.M., Thursday, College year began.
*Oct. 28—Wednesday, Founders' Day.
*Nov. 26—Thursday, Thanksgiving Day.
Dec. 23—12 M., Wednesday, First term ended.
1915—Jan. 7—9.45 A.M., Thursday, Second term began.
*Jan. 28—Chapel Services at 11 A.M., Thursday, Day of Prayer for Colleges.
*Feb. 22—Monday, Washington's Birthday.
*Feb. 24—Wednesday, Junior Week holiday.
Mar. 24—4 P.M., Wednesday, Second term ends.
Apr. 8—9.45 A.M., Thursday, Third term begins.
May 21–27—Final examinations of Senior class.
*May 31—Monday, Memorial Day.
June 7–12—Examination of three lower classes.
June 13—10.30 A.M., Sunday, Baccalaureate Sermon. 8 P.M., Sunday, Sermon before Brainerd Society.
June 14—2 P.M., Monday, Senior Class Day Exercises.
June 15—Tuesday, Alumni Day.
June 16—9.45 A.M., Wednesday, Commencement Exercises.
Sept. 13—9 A.M. to 12 M., 2 P.M. to 4 P.M., Monday, Registration for entrance.
Sept. 14–15—9 A.M., Tuesday, Wednesday, Examinations for admission. Re-examinations, three upper classes.
Sept. 16—9.45 A.M., Thursday, College year begins.
*Oct. 20—Exercises at 11 A.M., Wednesday, Founders' Day.
*Nov. 25—Thursday, Thanksgiving Day. (Recess, November 25, 12 M., Wednesday, to November 26, 9.45 A.M., Friday.)
Dec. 22—4 P.M., Wednesday, First term ends.

* No recitations.

LAFAYETTE COLLEGE.

Lafayette College is situated at Easton, Pa., upon a site of remarkable beauty, overlooking the confluence of the Delaware and Lehigh rivers. It is thoroughly furnished with the buildings and apparatus to do the work of a progressive college and polytechnic school, and also with the equipment, so important in this age, for a healthful and wholesome student life. Its large and able faculty represent the best traditions of scholarship as well as the recent extensions of scientific knowledge and the newer methods of research. It frankly recognizes its obligation to give its students training, as well as the opportunities for acquiring knowledge, and to make its discipline include moral and spiritual culture. Recent revisions of the requirements for admission and of the courses of study have been made. It will be found that these changes meet the demands of the day for liberty of choice without sacrificing the supreme consideration of thoroughness.

Easton is a railroad center and easily accessible from all directions. It is about seventy-five miles from New York, seventy from Philadelphia, eighty from Scranton and one hundred from Wilkes-Barre and Harrisburg. The Lehigh Valley, Pennsylvania, N. J. Central, Phila. & Reading, D. L. & W., and L. & H. Railways afford convenient and rapid facilities for railway travel. It is also an important industrial center, and there are many advantages afforded the students in the Technical courses by its location. Its situation insures the most perfect conditions for the promotion of health.

TRUSTEES.

John Welles Hollenback, Esq	Wilkes-Barre, Pa.
Hon. William S. Kirkpatrick. LL.D	Easton, Pa.
Rev. Ethelbert D. Warfield, D.D., LL.D	Los Angeles, Cal.
Isaac P. Hand, Esq	Wilkes-Barre, Pa.
James Gayley, M.E., Sc.D	New York City
Rev. D. J. Waller, Jr., Ph.D., D.D	Bloomsburg, Pa.
Israel P. Pardee, M.E	Hazleton, Pa.
Charles B. Adamson, M.S	Philadelphia, Pa.
J. Renwick Hogg, A.M	Philadelphia, Pa.
McCluney Radcliffe, M.D., LL.D	Philadelphia, Pa.
Rev. Leighton W. Eckard, D.D	Philadelphia, Pa.
Edgar M. Green, M.D	Easton, Pa.
John Markle, M.E	Jeddo, Pa.
Edward J. Fox, Esq	Easton, Pa.
David Bennett King, Esq	New York City
Nathan Grier Moore, Esq	Chicago, Ill.
William E. Baker, C.E	New York City
*Horace P. Glover, Esq	Mifflinburg, Pa.
†Rev. J. Balcom Shaw, D.D., LL.D	Los Angeles, Cal.
Rev. John B. Laird, D.D	Frankford, Pa.
Simon Cameron Long, C.E	Philadelphia, Pa.
John E. Fox, Esq	Harrisburg, Pa.
A. C. Overholt, B.S., A.M	Scottdale, Pa.
Wayne Dumont, Esq	Paterson, N. J.
Rev. Albert J. Weisley, D.D	Scranton, Pa.
Emery J. Kerrick, C.E	Germantown, Pa.
William A. May, A.M., C.E	Scranton, Pa.
Charles Heebner, Esq	Philadelphia, Pa.
J. George Becht, Sc.D	Harrisburg, Pa.
John H. MacCracken, Ph.D., LL.D	Easton, Pa.

Israel P. Pardee, *President*	Hazleton, Pa.
William S. Kirkpatrick, *Vice-President*	Easton, Pa.
Charles B. Green, *Secretary and Treasurer*	Easton, Pa.

MEETINGS OF THE TRUSTEES.

Thursday, February 11, 1915	WINTER MEETING.
Thursday, May 6, 1915	SPRING MEETING.
Monday, June 14, 1915	COMMENCEMENT WEEK.
Wednesday, October 20, 1915	FOUNDERS' DAY.

---

* Died December 2, 1914.

† Resigned February 11, 1915.

FACULTY.

*WILLIAM SEBRING KIRKPATRICK, LL.D.
President.

**JOHN HENRY MACCRACKEN, PH.D., LL.D.,
President.
(John I. Blair Foundation.)

REV. ROBERT BARBER YOUNGMAN, A.M., PH.D.,
Emeritus Professor of the Greek Language and Literature.

REV. SELDEN JENNINGS COFFIN, A.M., PH.D.,
Emeritus Professor of Astronomy.
(James H. Coffin Professorship of Astronomy.)

JOSEPH JOHNSTON HARDY, A.M., PH.D.,
Professor of Mathematics and Astronomy.
(George Hollenback Professorship of Mathematics.)

WILLIAM BAXTER OWEN, A.M., PH.D., LITT.D.,
Professor of the Latin Language and Literature.

EDWARD HART, PH.D.,
Dean of the Pardee Scientific Department, Professor of Analytical Chemistry.
(William Adamson Professorship of Analytical Chemistry.)

JAMES MADISON PORTER, C.E.,
Professor of Civil Engineering.

---

* President by appointment of the Board of Trustees from July 31, 1914, to February 1, 1915.

** President from February 1, 1915.

FRANCIS A. MARCH, JR., A.M., PH.D.,
Professor of the English Language.
(Francis A. March Professorship.)

WILLIAM SHAFER HALL, C.E., E.M., M.S.,
Professor of Technical Mathematics.

EDGAR MOORE GREEN, A.M., M.D.,
Consulting Physician in the Department of Physical Training.

ALVIN DAVISON, A.M., PH.D.,
Professor of Biology.
(Jesse Chamberlain Professorship of Botany.)

FREDERICK BURRITT PECK, PH.D.,
Professor of Mineralogy and Geology.

CLARENCE MCCHEYNE GORDON, PH.D.,
Professor of Physics.

* ALLAN ROBERTS, PhB., M.S.,
Professor of History

JAMES WADDELL TUPPER, PH.D.,
Professor of English Literature.

JAMES THERON ROOD, PH.D.,
Professor of Electrical Engineering.

WILLIAM THOMAS LYLE, C.E.,
Professor of Municipal Engineering.

EDWIN MOORE RANKIN, A.M., PH.D.,
Professor of Greek.

---

* Resigned June 15, 1914. Temporarily retained in the work of the department at the request of the acting President.

Edwin Oberlin Fitch, Jr., M.S.,
Professor of Mechanical Engineering.

Henry Wysor, B.S.,
Professor of Metallurgy.

Otho McCarroll Graves, B.S. in C.E.,
Professor of Graphics.

Rev. Samuel Albert Martin, A.M., D.D.,
Professor of Mental and Moral Philosophy.
(James Renwick Hogg Professorship.)

Carl Daniel Fehr, A.M.,
Professor of Modern Languages.

James Bryant Hopkins, A.M.,
Assistant Professor of Romance Languages.

William Benjamin Marquard, E.M.,
Assistant Professor of Mining Engineering.
(George B. Markle Professorship.)

Ernest Dean Tanzer, E.E.,
Assistant Professor of Electrical Engineering.

James Henry DeLong, B.S.,
Instructor in Chemistry.

William Huntington Kirkpatrick, A.B.,
Instructor in Municipal Law

*RAYMOND HENRY LACEY, A.M.,
Instructor in Latin.

HAROLD ANSON BRUCE,
Director of Physical Training.

WILLIAM TRUMBOWER FOSTER, PH.B., M.S.,
Instructor in Biology.

D. ARTHUR HATCH, E.M.,
Instructor in Mathematics.

JOHN CAWLEY, M.S.,
Instructor in Mathematics.

A. HENRY FRETZ, PH.D., C.E.,
Instructor in Geology and Mineralogy.

HARRY THOMAS SPENGLER, C.E.,
Instructor in Surveying and Railroad Engineering.

HUBERT EVELYN BRAY, A.B.,
Instructor in Mathematics.

HAROLD JOHN LOCKWOOD, E.E.,
Instructor in Physics.

WILLIAM SHANNON LOHR, B.S. in C.E.,
Instructor in Civil Engineering.

CLIFFORD ELLIOTT WILLIAMS, B.S. in C.E.,
Instructor in Cement Engineering.

ARTHUR DODD SNYDER, A.B.,
Instructor in Mathematics.

---

* Absent on leave.

ELBERT ROSS, B.S. in CHEM.,
Instructor in Chemistry.

CHARLES GARFIELD EICHLIN, A.B.,
Instructor in Physics.

RAYMOND VON DERSMITH GABLE, A.M.,
Instructor in Modern Languages.

FRED WILLIAM SLANTZ, B.S. in C.E.,
Instructor in Graphics.

HENRY CLINTON HUTCHINS, A.M.,
Instructor in English.

EDGAR COLBY KNOWLTON, A.M.,
Instructor in English.

LESHER WHARTON VANBUSKIRK, B.S. in C.E.,
Instructor in Civil Engineering.

MARK BALDERSTON, A.B.,
Instructor in Physics.

CLINTON ELLICOTT PEARCE, B.S.,
Instructor in Mechanical Engineering.

* CHARLES R. WASSER,
Instructor in Pattern Shop.

WILLIAM WALLAESA,
Instructor in Foundry.

REV. ADOLPH A. SCHWARZ,
Instructor in German.

---

* Resigned January 18, 1915.

THOMAS FRANCIS McDONALD, JR., PH.B.,
Instructor in Latin.

KURT OTTO KLAESSIG, A.B.,
Instructor in Modern Languages.

WILLIAM ASTON, A.B.,
Instructor in Latin and English.

JOHN PFROMM, B.S. in CHEM.,
Instructor in Chemistry.

FREDERICK HIRAM SPOTTS, A.B.,
Instructor in History and Mathematics.

ALBERT MORTON BIERSTADT, A.M.,
Instructor in English.

ROBERT VINCENT CRAM, A.M.,
Instructor in Greek.

SAMUEL D. CARPENTER, M.E.,
Instructor in Machine Shop.

NEVIN CECIL MITMAN,
Instructor in Forge Work.

HAROLD F. DURNER,
Instructor in Pattern Shop.

COLLEGE OFFICERS.

WILLIAM S. HALL, C.E., E.M., M.S.,
Clerk.

WILLIAM T. LYLE, C.E.,
Inspector of Buildings.

REV. JOHN F. STONECIPHER, D.D.,
Librarian.

REV. MAURICE A. FILSON, A.M.,
Assistant in Library.

EDWARD HART, PH.D.,
Curator of Gayley Hall, and Librarian of the Henry W. Oliver Library.

CHARLES B. GREEN, E.M.,
Registrar and Treasurer.

ALBERT MOORE LANE, PH.B.,
Bursar.

JOHN EDGAR FRETZ, A.M., M.D.,
Physician.

DEANS.

COLLEGE	Professor Roberts.
SENIOR CLASS	The President.
JUNIOR CLASS	Professors Peck and Martin.
SOPHOMORE CLASS	Professors Owen and Hall.
FRESHMAN CLASS	Professors Hopkins and Marquard and Messrs. Hatch and Cawley.

LAFAYETTE COLLEGE.

ADMISSION.

Every applicant for admission to the College is expected to report at the College offices and register immediately on his arrival. Before registering he must submit to the Registrar a satisfactory certificate of moral character from some person known to the College authorities, and a diploma or certificate of graduation from the school which he last attended, or, if he be not a graduate, a statement that he leaves the school with the approval of its principal and is honorably dismissed to this College, with a statement of the studies which he has pursued and the course which he desires to pursue. His application having been approved he is admitted to the examinations. Examinations are regularly held on the day following the annual commencement day in June, and the days preceding the first day of the Autumn term in September, and also on the first day of the second and third terms.

It is expected that every applicant for admission shall have pursued a four-year course of study in a high school or college preparatory school and shall have successfully completed his course of study representing an equivalent of sixteen hours per week for the four years. The specific requirements for the various courses are not intended to entirely cover all of the secondary school work, especially in the Technical and General Scientific

Courses, but only to represent such preparation as is indispensable to enable a student to carry on the studies which are to be pursued in those courses. It is expected that the certificate of study brought by each student will fully set forth the studies which he has pursued during his secondary school course.

REQUIREMENTS FOR ADMISSION TO THE FRESHMAN CLASS.

CLASSICAL COURSE.

Candidates are examined in the following subjects:

Geography.
History (A), (B) and (C).
Mathematics (A).
English.
Latin.
Greek.

(For details of subjects see pages 18–24.)

LATIN SCIENTIFIC COURSE.

Candidates are examined in the following subjects:

Geography.
History (A), (B) and (C).
Mathematics (A).
Physics or Chemistry.
English.
Latin.
German (A) and (B) or French (A) and (B).

(Candidates for the Classical and Latin Scientific Course offering Mathematics (A) and (B) can take advanced courses in Mathematics.)

GENERAL SCIENTIFIC COURSE.

Candidates are examined in the following subjects:

Geography.
History (A), (B) and (C).
Mathematics (A).
Physics or Chemistry.
English.
German (A) and (B) or French (A) and (B).

and one of the following subjects: Mathematics (B); a

Second Modern Language (A) and (B); Latin Grammar, 4 books of Caesar and 2 orations of Cicero or an equivalent.

CIVIL, MINING, ELECTRICAL AND MECHANICAL ENGINEERING AND CHEMICAL COURSES.

Candidates are examined in the following subjects:

Geography (A).
History (A), (B) and (C).
Mathematics (A) and (B).
Physics or Chemistry.
English.
German (A) and (B) or French (A) and (B).

DETAILS OF REQUIREMENTS FOR ADMISSION.

GEOGRAPHY.—It is expected that every applicant shall have had a full course in Political Geography and at least an introductory course in Physical Geography. This requirement need not be met by the secondary school if it has been previously complied with. For the Scientific courses, however, the more advanced study of Physical Geography or Physiography is recommended, and the candidate will receive full credit for such study.

HISTORY.

(A) ANCIENT HISTORY.—A short introduction setting forth the history of the earliest civilizations with particular study of Greek and Roman History down to the fall of Rome. The following books are recommended: Myers' "Rome, Its Rise and Fall;" Morey's, Leighton's or Allen's Roman History and Morey's or Oman's Greek History.

(B) MEDIAEVAL AND MODERN HISTORY.—Beginning with the results of the great Germanic invasions of Western Europe and tracing the rise of Modern History through the French Revolution epoch. Courses A and B are intended to constitute a course in General History and to give the student a general view of the development of modern civilization and fit him to pursue college courses in history, science, and philosophy with an intelligent understanding of the development of modern life and thought.

(C) AMERICAN HISTORY AND CIVIL GOVERNMENT.—The study of American History may be pursued prior to the secondary school and work done in the grammar grades will be accepted where there is evidence that it has been well done, but it is recommended that it should be a part of the secondary school course. The books of Fiske, McMaster and Johnston are recommended.

(D) ENGLISH HISTORY.—A detailed study of the History of England will be accepted as a part of the secondary school preparation but it is not specially required for any of the regular courses of this College and will not be accepted as a substitute for A and B.

MATHEMATICS (A).—*Arithmetic:* Complete, including the Metric System.

Algebra: Fundamental principles. Factoring. Fractions. Simple Equations. Involution. Evolution. Exponents. Quadratic Equations. Simultaneous Quadratic Equations. Equations Solved as Quadratics. Properties of Quadratic Equations.

Geometry: Plane Geometry entire; as in Wentworth, Wells or Loomis.

MATHEMATICS (B).—*Solid Geometry*

Algebra: Surds and Imaginaries. Simple Indeterminate Equations. Inequalities. Ratio. Proportions and Variations. Progressions.

Plane Trigonometry: Through the solution of right and oblique triangles (Hall and Funk's Trigonometry or an equivalent), candidates should bring their logarithmic tables to the examination.

PHYSICS.—The elementary principles (Millikan and Gale, Hall and Bergen; Carhart and Chute, Mann and Twiss or Hoadley).

CHEMISTRY.—Elements of Inorganic Chemistry.

ENGLISH.—The requirements are based on the recommendations of the Conference on Uniform Entrance Requirements in English. These recommendations are as follows:

The study of English in school has two main objects: (1) command of correct and clear English, spoken and written; (2) ability to read with accuracy, intelligence and appreciation.

GRAMMAR AND COMPOSITION.

The first object requires instruction in grammar and composition. English grammar should ordinarily be reviewed in the secondary school; and correct spelling and grammatical accuracy should be rigorously exacted in connection with all written work during the four years. The principles of English composition governing punctuation, the use of words, sentences, and paragraphs should be thoroughly mastered; and practice in composition, oral as well as written, should extend throughout the secondary school period. Written exercises may well comprise letter-writing, narration, description, and easy exposition and argument. It is advisable that subjects for this work be taken from the student's personal experience, general knowledge, and studies other than English, as well as from his reading in literature. Finally, special instruction in language and composition should be accompanied by concerted effort of teachers in all branches to cultivate in the student the habit of using good English in his recitations and various exercises, whether oral or written.

LITERATURE.

The second object is sought by means of two lists of books, headed respectively *Reading* and *Study*, from which may be framed a progressive course in literature covering four years. In connection with both lists, the student should be trained in reading aloud and be encouraged to commit to memory some of the more notable passages both in verse and in prose. As an aid to literary appreciation, he is further advised to acquaint himself with the most important facts in the lives of the authors whose works he reads and with their place in literary history.

A. READING.

The aim of this course is to foster in the student the habit of intelligent reading and to develop a taste for good literature, by giving him a first-hand knowledge of some of its best specimens. He should read the books carefully, but his attention should not be so fixed upon details that he fails to appreciate the main purpose and charm of what he reads.

With a view to large freedom of choice, the books provided for reading are arranged in the following groups, from each of which at least two selections are to be made, except as otherwise provided under Group I.

Books to be read: 1915–19.

Group I.—Classics in Translation. The *Old Testament*, comprising at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings, and Daniel, together with the books of Ruth and Esther. The *Odyssey*, with the omission, if desired, of Books I, II, III, IV, V, XV, XVI, XVII. The *Iliad*, with the omission, if desired, of Books XI, XIII, XIV, XV, XVII, XXI. The *Aeneid*. The *Odyssey*, *Iliad* and *Aeneid* should be read in English translations of recognized literary excellence. For any selection from this group a selection from any other group may be substituted.

Group II.—Shakespeare. *Midsummer-Night's Dream*, *Merchant of Venice*, *As You Like It*, *Twelfth Night*, *The Tempest*, *Romeo and Juliet*, *King John*, *Richard II*, *Richard III*, *Henry V*, *Coriolanus*, *Julius Caesar*, *Macbeth*, *Hamlet*.

Group III.—Prose Fiction. Malory: *Morte d'Arthur* (about 100 pages); Bunyan: *Pilgrim's Progress*, Part I; Swift: *Gulliver's Travels* (voyages to Lilliput and to Brobdingnag); Defoe: *Robinson Crusoe*, Part I: Goldsmith: *Vicar of Wakefield;* Frances Burney: *Evelina;* Scott's Novels: any *one;* Jane Austen's novels: any *one;* Maria Edgeworth: *Castle Rackrent*, or *The Absentee;* Dickens' novels: any *one;* Thackeray's novels: any *one;* George Eliot's novels: any *one;* Mrs. Gaskell: *Cranford;* Kingsley: *Westward Ho!* or *Hereward, the Wake;* Reade: *The Cloister and the Hearth;* Blackmore: *Lorna Doone;* Hughes: *Tom Brown's Schooldays;* Stevenson's *Treasure Island*, or *Kidnapped*, or *Master of Ballantrae;* Cooper's novels: any *one;* Poe: *Selected Tales;* Hawthorne: *The House of the Seven Gables*, or *Twice Told Tales*, or *Mosses from an Old Manse;* A collection of *Short Stories* by various standard writers.

Group IV.—Essays, Biography, Etc. Addison and Steele: *The Sir Roger de Coverley Papers*, or Selections from the *Tatler* and *Spectator* (about 200 pages); Boswell: Selections from the *Life of Johnson* (about 200 pages); Franklin: *Autobiography;* Irving: Selections from the *Sketch Book* (about 200 pages), or *Life of Goldsmith;* Southey: *Life of Nelson;* Lamb: Selections from the *Essays of Elia* (about 100 pages); Lockhart: Selections from the *Life of Scott* (about 200 pages); Thackeray: Lectures on *Swift, Addison.* and *Steele* in the *English Humorists;* Macaulay: Any one of the following essays: *Lord Clive, Warren Hastings, Milton, Addison, Goldsmith, Frederick the Great, Madame d'Arblay;* Trevelyan: Selections from the *Life of Macauley* (about 200 pages); Ruskin: *Sesame and Lilies,* or *Selections* (about 150 pages); Dana: *Two Years before the Mast;* Lincoln: *Selections,* including at least the two *Inaugurals,* the *Speeches in Independence Hall and at Gettysburg,* the *Last Public Address,* the *Letter to Horace Greeley;* together with a brief memoir or estimate of Lincoln; Parkman: *The Oregon Trail;* Thoreau: *Walden;* Lowell: *Selected Essays* (about 150 pages); Holmes: *The Autocrat of the Breakfast Table;* Stevenson: *An Inland Voyage* and *Travels with a Donkey;* Huxley: *Autobiography* and selections from *Lay Sermons,* including the addresses on *Improving Natural Knowledge, A Liberal Education,* and *A Piece of Chalk;* A collection of *Essays* by Bacon, Lamb, DeQuincey, Hazlitt, Emerson, and later writers; a collection of *Letters* by various standard writers.

Group V.—Poetry. Palgrave's *Golden Treasury* (First Series), Books I and III, with special attention to Dryden, Collins, Gray, Cowper, and Burns; Palgrave's *Golden Treasury* (First Series), Book IV, with special attention to Wordsworth, Keats, and Shelley (if not chosen for study under B); Goldsmith: *The Traveller* and *The Deserted Village;* Pope: *The Rape of the Lock;* A collection of English and Scottish *Ballads,* as, for example, some *Robin Hood* ballads, *The Battle of Otterburn, King Estmere, Young Beichan, Bewick and Grahame, Sir Patrick Spens,* and a selection from later ballads; Coleridge: *The Ancient Mariner, Christabel,* and *Kubla Khan;* Byron: *Childe Harold,* Canto III or IV, and *The Prisoner of Chillon;* Scott: *The Lady of the Lake,* or *Marmion;* Macaulay: *The Lays of Ancient Rome, The Battle of Naseby, The Armada, Ivry;* Tennyson: *The Princess,* or *Gareth and Lynette, Lancelot and Elaine,* and *The Passing of Arthur;* Browning: *Cavalier Tunes, The Lost Leader, How They Brought the Good News from Ghent to Aix, Home Thoughts from Abroad, Home Thoughts from the Sea, Incident of the French Camp, Hervé Riel, Pheidippides, My Last Duchess, Up at a Villa—Down in the City, The Italian in England, The Patriot, The Pied Piper, "De Gustibus—", Instans Tyrannus;* Arnold: *Sohrab and Rustum,* and *The Foresaken Merman;* Selections from *American Poetry,* with special attention to Poe, Lowell, Longfellow, and Whittier.

B. STUDY.

This part of the requirement is intended as a natural and logical continuation of the student's earlier reading, with greater stress laid upon form and style, the exact meaning of words and phrases, and the understanding of allusions.

Books to be studied: 1915–19 (one to be selected from each group).

Group I.—Drama. Shakespeare: *Julius Caesar, Macbeth, Hamlet.*

Group II.—Poetry. Milton: *L'Allegro, Il Penseroso,* and either *Comus* or *Lycidas;* Tennyson: *The Coming of Arthur, The Holy Grail,* and *The Passing of*

Arthur; The selections from Wordsworth, Keats, and Shelley in Book IV of Palgrave's *Golden Treasury* (First Series).

Group III.—Oratory. Burke: *Speech on Conciliation with America;* Macaulay's Two *Speeches on Copyright* and Lincoln's *Speech at Cooper Union;* Washington's *Farewell Address* and Webster's *First Bunker Hill Oration.*

Group IV.—Essays. Carlyle: *Essay on Burns*, with a selection from Burns' *Poems;* Macaulay: *Life of Johnson;* Emerson: *Essay on Manners.*

LATIN.—*Grammar:* The Roman method of pronunciation is used.

Caesar: *Commentaries*, four books, for a portion of which an equivalent in Nepos, Cicero's De Senectute or De Amicitia will be received.

Cicero: *Orations*, seven.

Virgil: *Aeneid*, six books, *Bucolics.*

Prose Composition: Daniell's or equivalent.

GREEK.—*Grammar:* The applicant should have a thorough acquaintance with the declensions of nouns, pronouns and adjectives and the conjugation of verbs. Especial emphasis is laid upon a familiarity with the forms of words and the essential principles of syntax. Pronunciation of words, with their written accents, should not be disregarded.

Prose Composition: Short sentences, based upon the *Anabasis*, will be set for translation from English into Greek. These are designed to test the applicant's knowledge of the important rules of syntax. (Collar and Daniell, or equivalent.)

Xenophon: *Anabasis*, four books, or an equivalent in the *Cyropaedia.* The student must be prepared to defend his translations of the passages set for examination.

Homer: *Iliad*, three books, or *Odyssey*, three books.

GERMAN (A).—An accurate knowledge of the principles of grammar, especially the inflection of articles, adjectives, pronouns, and nouns, the conjugation of the weak and strong verbs, the uses of the modal auxiliaries; the prepositions and their government; the elementary rules of syntax and work order; ability to read at sight ordinary German prose. It is believed that this requisite facility can be acquired by reading not less than two hundred duodecimo pages of simple German.

GERMAN (B).—This includes a thorough knowledge of accidence, of the elements of word-formation, and of the principal uses of the prepositions and conjunctions. The candidate should be familiar with the essentials of German syntax, and must possess the ability to translate into German easy English prose; to translate at sight passages from standard classical authors. The reading of at least three hundred and fifty pages in addition to that required under German (A) will develop such ability. For examination no specific authors or works are designated. Each candidate is required to bring a statement from his teacher, mentioning text-books used and authors read, including the number of pages translated.

FRENCH (A).—This embraces a thorough knowledge of the rudiments of grammar, including the inflection of the regular and the more common irregular verbs; the inflection of nouns and adjectives for gender and number; the uses of articles and partitive constructions; the forms and positions of personal pronouns; the uses of the other pronouns. Candidates should be able to read at sight ordinary modern prose. It is believed that this ability is acquired by reading two hundred duodecimo pages from the works of at least three different authors.

FRENCH (B).—Candidates should show a thorough knowledge of accidence, and a familiarity with the essentials of French syntax, especially the uses of the tenses, modes, prepositions and conjunctions. They must be able to translate into French a connected passage of simple English, and to translate at sight standard French authors. This proficiency may be acquired by reading, in addition to that required under French (A), not less than four hundred pages of the works of various standard authors. For examination no special authors or works are designated. Applicants should present a statement from their teachers setting forth the text-books used and the number of pages translated.

PARTIAL OR SPECIAL COURSES.

In addition to the courses above specified, students may be admitted under exceptional circumstances to pursue courses of study of a special character not leading to a degree. Such students are required to undergo such preliminary examination as may be deemed necessary to ascertain their fitness to pursue the proposed course. The examination will cover at least the requirements of some one of the regular courses if the student comes to College from a preparatory school. The needs of men of maturity who have been engaged in active pursuits and wish to fit themselves for more advanced work will be granted special consideration when the Faculty deem it wise. When admitted they are subject to the same rules and regulations and the same examinations in the studies pursued as are other undergraduates. On completing their course they will receive, on application, certificates of proficiency in such studies as they have satisfactorily completed.

ADVANCED STANDING.

Candidates for advanced standing are examined not only in the preparatory studies, but also specially in the previous studies of the class they wish to enter, or their full equivalents. No certificate from a preparatory school will be accepted as a substitute for college work.

Students from another College bringing certificates of rank and honorable dismissal are admitted to recite on trial with corresponding rank in this College, until there is sufficient test of their qualification for admission to regular standing. They will, however, be examined in the earlier studies of the course they enter which are not included in the curriculum of the College from which they come, unless there are full equivalents.

No student, whether from another College or not, will be admitted to the Senior class as a candidate for a degree after the beginning of the second term.

CONDITIONS.

Students who fail to pass in a part of the subjects in which they are examined may be admitted upon the condition that they pass a satisfactory examination on such subjects before the end of the term next after that in which they enter. The number of such conditions with which a student is admitted to the College will be determined in each case by a vote of the Faculty.

When a student is admitted upon the condition that he make up one or more deficiencies in a special delinquent class arranged by the College for the benefit of such students he will be required to pay a fee for such course in addition to other College charges.

CERTIFICATES.

Certificates of the Examination Board of the Association of Colleges and Preparatory Schools of the Middle States and Maryland, of the Regents of the University of the State of New York and of certain approved preparatory schools are received in lieu of examination for entrance. Certificates, which will be accepted only from graduates of regularly prescribed preparatory courses, must be signed by the principal and certify only to work done during school hours. They should be filed with the Registrar before the entrance examination in June. Blank certificates will be furnished upon application. Whenever the certificate does not cover one or more of the requirements of admission or supply a satisfactory equivalent, an examination upon such subject or subjects will be required. Such certificates will not be received after one year from the completion of the period of study for which they are given unless an additional certificate of continued study accompany them.

MATRICULATION.

No student is considered a regular member of the College until after his matriculation, which takes place thirty days after his entrance. During the interval between his admission and matriculation he is, however, in all respects subject to the laws of the College.

DESCRIPTION OF COURSES.

Three courses of study are offered in the Academic department leading to appropriate degrees. These courses have been carefully arranged so as to provide a thorough mental discipline and prepare the student to pursue to advantage the learned professions or to meet the requirements of a business career. The Freshman and Sophomore years are prescribed. The Junior and Senior years are half prescribed and half elective. A very wide choice of studies is provided both by the threefold arrangement of courses and by the numerous electives of the last two years. At the same time continuity and thoroughness are secured by the requirement of a large part of the curriculum.

The Technical courses are prescribed throughout. They are arranged so as to provide in the earlier years a general education of the kind that is indispensable for the successful pursuit of the engineering and chemical professions; and in the later years a thorough professional training.

Every student is expected to arrange a schedule of at least sixteen weekly exercises. These exercises are calculated on the basis of *periods*—the period being the equivalent of one recitation hour or three hours of drawing room, laboratory, or field work. A lecture which does not require previous preparation may be combined with two hours of practical work in a *period*.

The following courses of study are offered:

Classical Course.

Leading to the degree of A.B.

Latin Scientific Course with Greek.

Leading to the degree of A.B.

Latin Scientific Course without Greek.

Leading to the degree of Ph.B.

General Scientific Course.

Leading to the degree of B.S.

Civil Engineering Course.

Leading to the degree of C.E.

Mining Engineering Course.

Leading to the degree of E.M.

Electrical Engineering Course.

Leading to the degree of E.E.

Mechanical Engineering Course.

Leading to the degree of M.E.

Chemical Course.

Leading to the degree of B.S. in Chemistry.

COURSE NUMBERS.

For description of courses see pages 94–149.

Language and Literature.

1– 50	English
51– 70	Elocution.
71–160	German and Romance Languages.
161–200	Classics.
201–210	Hebrew.

HISTORY, POLITICAL SCIENCE, AND PHILOSOPHY.

221–250	BIBLE.
251–310	PHILOSOPHY.
311–340	HISTORY.
341–400	POLITICAL AND SOCIAL SCIENCE.

SCIENCE AND MATHEMATICS.

401–440	MATHEMATICS.
441–460	GRAPHICS.
461–490	PHYSICS.
491–530	GEOLOGY.
531–550	ASTRONOMY.
551–580	BIOLOGY AND HYGIENE.

CIVIL ENGINEERING.

601–610	SURVEYING.
611–620	RAILROADS.
621–630	MECHANICS.
631–640	ROADS AND PAVEMENTS.
641–650	MASONRY.
651–660	CEMENT AND CONCRETE.
661–670	HYDRAULICS.
671–680	SEWERAGE.
681–689	WATER SUPPLY.
690–698	ROOFS AND BRIDGES.
699–700	THESES.

MINING ENGINEERING.

701–705	MINE SURVEYING.
706–710	MINE EXPLORATION.
711–715	DEEP BORING.
716–720	DRILLING, BLASTING, AND AIR COMPRESSION.
721–725	SHAFT SINKING AND DRIFTING.
726–730	MINE EXPLOITATION.
731–735	MINE HAULAGE AND HOISTING.
736–740	MINE VENTILATION AND LIGHTING.
741–745	MINE DRAINAGE.

746–750	MINE CONSTRUCTION.
751–755	ORE DRESSING.
756–760	MINING LAW.
761–765	MINE MACHINERY.
766–770	MINE ADMINISTRATION.
771–775	THESES.

ELECTRICAL ENGINEERING.

801–810	GENERAL DIRECT CURRENT ENGINEERING.
811–820	GENERAL ALTERNATING CURRENT ENGINEERING.
821–830	ELECTRICAL LABORATORY.
831–840	ENGINEERING ABSTRACTS.
841–850	ELECTRICAL DESIGN.
851–860	ELECTRICAL POWER UTILIZATION.
861–870	ELECTRIC POWER TRANSMISSION.
871–880	ELECTRIC POWER GENERATION.
881–890	ELECTRICAL COMMUNICATION.
891–900	THESES.

CHEMISTRY.

901–950	CHEMISTRY.
951–960	METALLURGY.
961–970	TECHNICAL GERMAN.
971–980	THESES.

MECHANICAL ENGINEERING.

1001–1010	SHOP WORK.
1011–1020	DESIGN.
1021–1030	STEAM ENGINEERING.
1041–1050	GAS ENGINEERING.
1051–1060	HEATING AND VENTILATING.
1061–1070	INDUSTRIAL MANAGEMENT.
1071–1080	THESES.

ALPHABETICAL SUBJECT INDEX.

Numbers immediately following the subject refer to the courses of study, pages 94-149.

Numbers in parenthesis indicate the year and term in which the subject is given.

Page.

Agricultural Chemistry........973 (IV, 2) 146
Algebra........401-5 (I, 1-3) 118
Alternating Current Engineering........811-12 (III, 1-2) 141
American History........321-4 (II, 1-3; III, 2) 115
Analytical Geometry........416-20 (I, 3; II, 1-2) 118
Anatomy, Mammalian........551 (III, 1) 128
Ancient History........311 (I-III) 115
Anglo-Saxon........10 (II, 2) 95
  11-13 (III, 1-3; IV, 1-3) 95
Assaying........955 (IV, 2) 146
Astronomy
  Descriptive........531 (IV, 1) 127
    536 (IV, 1) 127
  Practical........541-2 (IV, 2-3) 127
  For Engineers........543 (III-3) 127
Bacteriology and Hygiene........554 (IV, 1) 129
Bible
  English........221-6 (I, II, 1-3) 112
    233-5 (III, 1-3) 112
  Greek........227-9 (II, 1-3) 112
    236-8 (III, 1-3) 112
  Latin........230-2 (II, 1-3) 112
    239-41 (III, 1-3) 112
  History of........244 (IV, 1) 112
Biology
  General........553 (III, 3) 129
  Sanitary........561 (III, 3) 130
Blackstone........361-2 (IV, 2-3) 116
Boilers........1021 (III, 1-2) 148
Botany........571 (III, 1) 130
Bridge Design........695-6 (IV, 2-3) 137
Business Law........363-4 (IV, 2-3) 116
Calculus........426-7 (II, 1-2) 119
  429-31 (III, 1-3) 119

Cement.....651, 654 (III, 1) 135
Chemical Arithmetic.....917 (II, 3) 144
Chemical Engineering.....934 (IV, 1) 145
Chemical Technology.....935 (IV, 2) 145
Chemistry
  Inorganic.....901 (II, 3) 143
  911–12 (I, 1–2) 144
  Organic...908–10, (IV, 1–3) 920–2 (III, 1–3) 144
  Theoretical.....919 (III, 1) 144
  924–5 (III, 2–3) 145
  Thesis Work.....971–2 (IV, 2–3) 146
Church History.....242–3 (IV, 2–3) 112
Comparative Government.....351–3 (IV, 1–3) 116
Comparative Philology.....30–1 (IV, 3) 97
Concrete.....652–3, 655–6 (III, 2–3) 135
Constitutional History, United States, 341, 345–6 (III, 3; IV, 2–3) 116
Crystallography.....493 (III, 3) 125
495 (IV, 2) 125
511 (III, 1) 125
Descriptive Geometry.....451 (II, 1–3) 121
Differential Equations.....432 (IV, 1) 120
437 (II, 3) 120
Drawing.....441 (I, 1–3) 120
Dynamics of Machines.....1013 (IV, 3) 148
Economics.....371–2 (IV, 2–3) 117
Electrical Design.....841–2 (IV, 1–2) 142
Electrical Laboratory.....821–4 (III, 1–3; IV, 1) 141
825–8 (III, 2–3; IV, 2–3) 141
Electrical Power Stations.....871 (IV, 2) 143
Electrical Power Transmission.....861 (IV, 1) 143
Electrical Problems.....806–7 (III, 1–2) 140
Electrical Railroad.....853 (IV, 3) 143
Elements of Electrical Engineering.....804 (III, 1) 140
Elocution.....51–2 (I, 2–3) 97
53–5 (II, 1–3) 98
56–8 (III, 1–3) 98
59–61 (IV, 1–3) 98
Embryology and Histology.....556 (IV, 3) 130

Engineering Abstracts		831 (III, 1–3; IV, 1–3)	142
		1073 (III, 3)	149
English Composition and Rhetoric		1–3 (I, 1–3)	95
English for Technical Students		4–6 (IV, 1–3)	95
English History		331–2 (III, 1–2)	116
English Language	Bacon	19 (III, 1)	96
	Bunyan	16 (II, 1)	96
	Chaucer	18 (II, 3)	96
	Drama	23–4 (IV, 2–3)	97
	Fiction	22–4 (IV, 1–3)	97
	Holmes	21 (III, 3)	96
	Kipling	22 (IV, 1)	96
	Milton	20 (III, 2)	96
	Shakespeare	19–21 (III, 1–3)	96
	Spenser	17 (II, 2)	96
	Trench	14 (II, 1)	96
English Literature	16th and 17th Century	41–2 (III, IV, 1–2)	97
	18th Century	43 (III, IV, 3)	97
	Romantic Poets	44 (III, IV, 1)	97
	Later 19th Century poets	45–6 (III, IV, 2–3)	97
Ethics		281 (IV, 1)	113
Eugenics		556 (IV, 3)	130
European History		312–4 (I, 1–3)	115
Forging		1001 (II, 1–3)	147
Foundry		1001 (II, 1–3)	147
French		111–113 (I, 1–3)	102
		114–116 (II, 1–3)	102
		121–123 (I, 1–3)	102
		127–129 (II, 1–3)	102
		131–133 (III, 1–3)	102
		134–136 (III, 1–3)	103
		137–139 (IV, 1–3)	103
		140 (IV, 3)	103
		141–142 (IV, 2–3)	103
		143–145 (IV, 1–3)	103
General Testing Laboratory		625–6 (III, 1–2)	134

Geology
  Dynamical . . . . 491 (III, 1) 125
  Economic . . . . 521 (IV, 2) 126
  Field . . . . 494 (IV, 1) 125
    496 (IV, 3) 125
    522 (IV, 3) 126
  General . . . . 516–17 (IV, 1–2) 126
  Historical . . . . 492 (III, 2) 125
  Mining . . . . 523–4 (IV, 1–2) 126
Geometry . . . . 406–7 (I, 1) 118
German . . . .
  71–73 (I, 1–3) 99
  74–76 (II, III, 1–3) 99
  77–79 (III, IV, 1–3) 99
  81–82 (I, 1–2) 100
  86 (I, 3) 100
German Literature . . . .
  87–89 (II, 1–3) 100
  91–93 (III, IV, 1–3) 100
  94–96 (III, IV, 1–3) 100
  97–99 (III, IV, 1–3) 101
  100 (III, IV, 2) 101
  101–103 (IV, 1–3) 101
  104–106 (IV, 1–3) 101
  110 (IV, 3) 101
Graphic Statics . . . . 698 (IV, 1) 137
Greek
  Aeschines . . . . 167 (III and IV, 1) 107
  Aeschylus . . . . 169, 180 (III and IV, 3) 107–109
  Aristophanes . 166, 170, 180 (II, 3; III, 1; IV, 1, 3) 107–109
  Attic Orators . . . . 165, 178 (II, 2; IV, 1) 107–109
  Demosthenes . . . . 167 (III and IV, 1) 107
  Drama . . . . 166 (II, 3) 107
  Herodotus . . . . 162, 175 (I, 2 and III, 1) 106–109
  Homer . . . . 163–4, 174–5 (I, 3; II, 1–3; III, 1) 107–108
  Lyric Poets . . . . 172 (III and IV, 3) 108
  Lysias . . . . 161 (I, 1) 106
  Menander . . . . 170 (III and IV, 1) 107
  Plato . . . . 161, 172*a*, 177 (I, 1; III and IV,-3) 106–8–9
Greek
  Sophocles . . . 166, 168, 179 (II, 3; III and IV, 2) 107–109
  Theocritus . . . . 172 (III and IV, 3) 108
  Thucydides . . . . 171, 176 (III and IV, 2) 108–109
  Xenophon . . . . 161, 173, 174, 177 (I, 1–3; II, 1, 3; III, 3) 106–8–9

Heating and Ventilation		1051 (IV, 3)	149
Hebrew		201–2 (IV, 2–3)	111
History of Education		301 (III, IV, 1–2)	114
History of Philosophy		291 (IV, 2–3)	114
Hydraulics		661–2 (III, 3; IV, 1)	136
		663–4 (III, 3; IV, 1)	136
Hydro-Electric Engineering		872 (IV, 3)	143
Hygiene		580 (I, 1)	131
Illuminating Engineering		852 (III, 3)	142
Industrial Management		1061 (IV, 1)	149
International Law		365 (IV, 1)	117
Italian		151–3 (III, 1–3)	104
		154–6 (IV, 1–3)	104
Latin	Cicero	184 (II, 1)	110
		186 (II, 3)	110
	Horace	182–3 (I, 2–3)	110
	Hymns	185 (II, 2)	110
	Juvenal	188 (III, 2)	110
	Letters	191 (IV, 2)	110
	Livy	181 (I, 1)	110
	Lucretius	192 (IV, 3)	110
	Tacitus	187 (III, 1)	110
		189 (III, 3)	110
	Terence or Plautus	190 (IV, 1)	110
Lead Burning		974 (IV, 2)	146
Least Squares		436 (II, 3)	120
Lettering		442 (I, 1)	121
Logic		251 (III, 3)	113
Machine Design		1012 (IV, 1–3)	148
Machine Drawing		452 (II, 3)	122
Machine Shop		1001 (II, III, 1–3)	147
Masonry		641–2 (III, 3; IV, 1)	134
Mechanics, Applied		621–2 (II, 3; III, 1)	133
Mechanics of Materials		623–4 (III, 1–2)	133
Mechanism		1011 (II, 1–3)	147
Mensuration		421 (I, 3)	119
Metallurgy		951–2 (III, 1–2)	146
		953–4 (IV, 1–2)	146

Mine Administration........761 (IV, 3) 140
Mine Construction........746–48 (IV, 1–3) 139
Mine Machinery........756 (IV, 2) 140
Mine Surveying........701 (III, 2) 138
Mineralogy........513 (III, 3) 125
706 (III, 2) 138
Mining........711 (III, 3) 138
716 (III, 3) 138
721 (IV, 1) 138
726 (IV, 1) 138
731 (IV, 2) 139
736 (IV, 2) 139
741 (III, IV, 3) 139
Mining Law........766 (III, IV, 3) 140
Motor Engineering........851 (III, 2) 142
Mining Theses........771 (IV, 3) 140
Ore Dressing........751 (III, IV, 3) 139
Orthographic Projection........443 (I, 2–3) 121
Pattern Shop........1001 (II, 1–3) 147
Petrography........512 (III, 2) 125
Philosophy........254 (IV, 1) 113
Physical Culture........581 (I, 1–3) 131
Physics........461–3 (II, 3; III, 1–2) 122
464–5 (III, 3) 123
466–71 (IV, 1–3) 123
472–7 (II, 1–3) 124
Physiology........555 (IV, 2) 129
Political Science........351–3 (IV, 1–3) 116
Psychology........252 (III, 2–3) 113
303 (III, IV, 3) 114
Qualitative Analysis........902–4 (III, IV, 1–3) 144
913–15 (I, 3; II, 1–2) 144
926–9 (I, 2–3; II, 1–2) 145
Quantitative Analysis........905–7 (IV, 1–3) 144
916 (II, 3) 144
918 (III, 1) 144
930–2 (II, 3; III, 2–3) 145
933 (IV, 1) 145

Railroads.....611–12 (II, 2–3) 133
614–5 (III, 1–2) 133
Roads and Pavements.....631–2 (III, 2) 134
Roof Design.....694 (IV, 1) 137
Roofs and Bridges.....690–3 (III, 3; IV, 1–3) 136
Sewerage.....671–2 (IV, 1–2) 136
Spanish.....141–3 (III, 1–3) 103
144–6 (IV, 1–3) 104
Steam Engineering.....1023 (III, 2) 148
Steam Engines.....1025 (III, 3) 149
Summer School.....602 (I, 3) 132
613 (II, 3) 133
Surveying.....601 (I, 3) 132
603–4 (II, 1; III, 3) 132
Technical German.....961–6 (III, 1–3; IV, 1–3) 146
Telephone.....881 (IV, 3) 143
Theism.....302 (IV, 2) 114
Theory of Functions.....433–4 (IV, 2–3) 120
Thermodynamics.....1024 (IV, 1–2) 148
Trigonometry.....411–13 (I, 1–3; II, 1) 118
Turbines.....1022 (IV, 2–3) 148
Water Supply.....681–2 (IV, 2–3) 136
Zoology.....552 (III, 2) 129

CLASSICAL COURSE.

The Classical Course leads to the degree of Bachelor of Arts. In order to meet the conditions of contemporary life in which so many schools do not prepare students in Greek for admission to the Classical Course, an arrangement has been made whereby students may enter the Latin Scientific Course and begin Greek in their Freshman Year. Those students who continue to pursue the prescribed course in Greek for four years will receive the Bachelor of Arts degree.

This course affords the best preparation for the professions of law, medicine, and theology. The intellectual training and the specific matters of instruction are particularly adapted to the needs of those who follow these professions. It is sometimes doubted whether it is so well adapted to the preparation for the study of medicine as some of the other courses, but the technical vocabulary of medicine is so largely drawn from the Greek, and the history of the medical profession is so closely associated with the development of science in and through the Classical languages as to make it eminently desirable that the cultivated physician should have a classical education. The course includes all the instruction in Physics, Chemistry and Biology which is required for the admission to the best medical schools. It is so well understood that a classical training is highly desirable for the lawyer and the minister that no reference need be made to these professions except to point out that this course offers the broadest and most liberal culture and that there is a marked reaction in the educational world toward its approved methods. The same is true of the education of the teacher and the journalist. Indeed, it is the broadest in its outlook and the most far-reaching in its foundations. The addition of a wide range of elective studies has made it a desirable preparation for the study of any profession, whether literary or scientific.

The instruction embraces a systematic study of the Bible and the Evidences of Christianity throughout the course, of the Ancient and Modern Languages and their literatures, together with Comparative Philology; Pure and Applied Mathematics; Physics, Chemistry, and the Natural Sciences; Rhetoric and Elocution; Logic and Metaphysics; History and Political Science; and Mental and Moral Philosophy.

SYNOPSIS OF STUDIES.

CLASSICAL COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA 2 AND SOLID GEOMETRY 2†	4	402 & 406
OR		
SOLID GEOMETRY‡	4	407
GREEK	4	161
LATIN	4	181
ENGLISH	2	1
HYGIENE	1	580
THE BIBLE	1	221

* See pages 94–149.

† Entered with Mathematics B, Division A.

‡ Entered with Mathematics A, Division B.

Second Term.

	Periods per week.	Course number.*
ALGEBRA†	4	403
OR		
ALGEBRA‡	4	404
GREEK	4	162
LATIN	4	182
ENGLISH	2	2
ELOCUTION	1	51
THE BIBLE	1	222

Third Term.

TRIGONOMETRY†	4	412
OR		
ALGEBRA‡	4	405
GREEK	4	163
LATIN	4	183
ENGLISH	2	3
ELOCUTION	1	52
THE BIBLE	1	223

SOPHOMORE YEAR.

First Term.

ANALTYICAL GEOMETRY†	4	418
OR		
TRIGONOMETRY‡	4	413
GREEK	4	164
LATIN	4	184
ENGLISH	2	14
FRENCH	2	114
ELOCUTION	1	53
THE BIBLE	1	227
THEME	1	62

* See pages 94–149.

† Entered with Mathematics B, Division A.

‡ Entered with Mathematics A, Division B.

Second Term.

	Periods per week.	Course number.[*]
PLANE AND SOLID ANALYTICAL GEOMETRY[†]	4	419
OR		
PLANE ANALYTICAL GEOMETRY[‡]	4	420
GREEK	4	165
LATIN	4	185
ENGLISH	2	10
FRENCH	2	115
ELOCUTION	1	54
THE BIBLE	1	228
THEME	1	62

Third Term.

PHYSICS	4	461
GREEK	4	166
LATIN	2	186
FRENCH	2	116
CHEMISTRY	2	901
ELOCUTION	1	55
THE BIBLE	1	229
THEME	1	62

JUNIOR YEAR.

First Term.

PHYSICS	4	462
GERMAN	2	74
ELOCUTION	1	56
THE BIBLE	1	236
THEME	1	62

ELECTIVES.

MATHEMATICS	4	429
GREEK	4	167
GREEK	2	172*a*

---

[*] See pages 94–149.

[†] Entered with Mathematics B, Division A.

[‡] Entered with Mathematics A, Division B.

	Periods per week.	Course number.*
GEOLOGY	2	491
ENGLISH A	4	19
CHEMISTRY	2	902
BIOLOGY	2	551
FRENCH	2	131
HISTORY	2	331
LATIN	2	187
BIOLOGY	2	571
ENGLISH B	4	41
HISTORY OF EDUCATION	2	301
SPANISH	2	141
ITALIAN	2	151

Second Term.

	Periods per week.	Course number.*
PHYSICS	4	463
PHILOSOPHY	3	252
GERMAN	2	75
ELOCUTION	1	57
THE BIBLE	1	237
THEME	1	62

ELECTIVES.

	Periods per week.	Course number.*
GERMAN	2	75
ENGLISH A	4	20
MATHEMATICS	4	430
GEOLOGY	2	492
GREEK	4	168
GREEK	2	172*a*
HISTORY	2	324
CHEMISTRY	2	903
HISTORY	2	332
FRENCH	2	132
LATIN	2	188
BIOLOGY	4	552
ENGLISH B	4	42

---

* See pages 94–149.

	Periods per week.	Course number.*
SPANISH	2	142
ITALIAN	2	152
HISTORY OF EDUCATION	2	301
Third Term.		
GERMAN	2	76
HISTORY	2	341
LOGIC	2	251
PHILOSOPHY	3	252
ELOCUTION	1	58
THE BIBLE	1	238
THEME	1	62
ELECTIVES.		
ENGLISH A	4	21
MATHEMATICS	4	431
GEOLOGY	2	493
GREEK	4	169
GREEK	2	172*a*
PHYSICS	2 or 4	464-5
CHEMISTRY	2	904
BIOLOGY	4	553
FRENCH	2	133
LATIN	2	189
ENGLISH B	4	43
SPANISH	2	143
ITALIAN	2	153
EDUCATIONAL PSYCHOLOGY	2	303
SENIOR YEAR.		
First Term.		
ASTRONOMY	4	536
PHILOSOPHY	3	281
ELOCUTION	1	59
BIBLE	1	244
THEME	1	62

* See pages 94-149.

ELECTIVES.

	Periods per week.	Course number.*
ENGLISH A	4	22
POLITICAL SCIENCE	2	351
PHILOSOPHY	2	254–301
PHYSICS	2 or 4	466–7
CHEMISTRY	2	902, 905 or 908
INTERNATIONAL LAW	2	365
MATHEMATICS	2	432
GERMAN	2	77
BIOLOGY	4	554
ENGLISH B	4	44
GREEK	4	170
GREEK	2	172*a*
FRENCH	2	134
GEOLOGY	2	494
LATIN	2	190
ANGLO-SAXON (optional)	1	11
SPANISH	2	144
ITALIAN	2	154

Second Term.

PHILOSOPHY	2	302
ECONOMICS	2	371
ELOCUTION	1	60
BIBLE	1	242–243
THEME	1	62

ELECTIVES.

HISTORY	2	345
MATHEMATICS	2	433
GEOLOGY	2	495
ENGLISH A	4	23
BIOLOGY	4	555
GREEK	4	171
GREEK	2	172*a*

* See pages 94–149.

	Periods per week.	Course number.*
GERMAN	2	78
FRENCH	2	135 or 138
LATIN	2	191
HEBREW	2	201
PHILOSOPHY	2	291, 301
ENGLISH B	4	45
BLACKSTONE	2	361
BUSINESS LAW	2	363
PHYSICS	2 or 4	468–9
CHEMISTRY	2	903, 906 or 909
ASTRONOMY	2	541
POLITICAL SCIENCE AND COMPARATIVE GOVERNMENT	2	352
ANGLO-SAXON (optional)	1	12
SPANISH	2	145
ITALIAN	2	155
Third Term.		
ECONOMICS	2	372
PHILOLOGY	3	30
ELOCUTION	1	61
BIBLE	1	242–243
THEME	1	62
ELECTIVES.		
HISTORY	2	346
MATHEMATICS	2	434
GERMAN	2	79
GEOLOGY	2	496
ENGLISH A	4	24
BIOLOGY	4	556
GREEK	4	172
GREEK	2	172*a*
FRENCH	2	136 or 139
LATIN	2	192
HEBREW	2	202

---

* See pages 94–149.

	Periods per week.	Course number.*
ENGLISH B	4	46
BLACKSTONE	2	362
BUSINESS LAW	2	364
PHYSICS	2 or 4	470–1
CHEMISTRY	2	904, 907 or 910
ASTRONOMY	2	542
POLITICAL SCIENCE AND COMPARATIVE GOVERNMENT	2	353
PHILOSOPHY	2	291, 303
ANGLO-SAXON (optional)	1	13
SPANISH	2	146
ITALIAN	2	156

* See pages 94–149.

PARDEE SCIENTIFIC DEPARTMENT.

This Department was organized in 1866, in accordance with the conditions of a gift from Ario Pardee, Esq., of Hazleton, Pa. The original organization has been, from time to time, greatly enlarged and extended largely through the continued munificence of the founder. There are at present two general courses of study, Latin Scientific and General Scientific, and five technical courses.

LATIN SCIENTIFIC COURSE.

This course, which leads to the Degree of Bachelor of Philosophy, was designed to meet the wishes of those who desire to pursue a course of liberal study without Greek. It is the same as the Classical Course except that the time devoted to the study of Greek in that course is given to the study of modern languages; great importance is paid to the study of the English language under the special direction of Professor Francis A. March, Jr.

By a new arrangement, those students in the Latin Scientific Course who desire to do so may begin Greek in the Freshman year, substituting it in Freshman and Sophomore years for modern languages. Those who pursue the study of Greek under this arrangement for four years may qualify for the Bachelor of Arts degree.

SYNOPSIS OF STUDIES.

LATIN SCIENTIFIC COURSE.

The course of study is the same as the Classical Course except as follows:

FRESHMAN YEAR.

German 81 and 82, 86 is substituted for Greek, four periods a week being given to this subject during the three terms.

SOPHOMORE YEAR.

The Bible is read in Latin 230–31–32 instead of Greek. English 16–17–18 and German 87–88–89 are substituted for Greek.

JUNIOR YEAR.

The Bible is read in Latin 239–40–41 instead of Greek. English History 331 is substituted for German. German 91, 92, 93 or 94, 95, 96 are substituted for 74, 75, 76.

(For schedule of studies of the Classical Course see pages 40–47.)

GENERAL SCIENTIFIC COURSE.

This course was originally arranged to meet the demand for a course substituting the modern languages for Latin and Greek, and offering greater opportunities for the study of the sciences than was formerly given in the Classical Course. The extension of the elective system has greatly modified the character of this course. It now is rather designed to meet the requirements of students who, in their preparatory course, have failed to take advantage of opportunities for the study of the classics, and who are seeking a general preparation for business careers or for other callings which do not seem to require an acquaintance with the classical languages and literatures. In order to meet the very different inclinations of students and to make a close articulation with a large number of preparatory schools, a greater latitude is allowed in the preparation for this course than for the other courses, and more consideration is given to individual choice in its earlier years.

Those students who offer advanced mathematics for admission are expected to pursue advanced courses in mathematics and drawing with the students of engineering courses. Those who enter with the same requirement in mathematics as the students of the Latin Scientific Course will pursue the mathematics of that course. Those who offer advanced mathematics will also be expected to pursue the course in chemistry of the engineering courses and to take options connected with the mathematical group throughout the Freshman year. Those who do not offer advanced mathematics will be permitted to choose at the outset of their course between a more distinctly mathematical and scientific course and one offering more extensive courses in modern languages and history. The choice once made will be binding throughout the first two years.

The degree awarded at the completion of this course is Bachelor of Science.

Frequent request is made by students entering this course to be allowed so to modify its requirements as to anticipate some of the courses, particularly those in physics and biology, and thus provide a two years' course on a special schedule. The ground for this request is generally the purpose to prepare for admission to a school of medicine. The arrangement of this course, and more particularly of the Latin Scientific Course, with the opportunities for the election of extensive courses in Biology, Chemistry, Physics, and German has been made after consultation with leading teachers of medicine, and with the view of preparing students for the best medical schools. The order in which the sciences are studied has been carefully considered. The degree of mental development has determined the period in which each study is taken up. The importance of the mental discipline and the equipment of the student for his future work has been met in the requirements in Mathematics, English, and Psychology. In all of these respects this course, like all the courses offered by the College, aims rather at thoroughness than quickness of preparation. It is intended to impress upon the student that success in any profession or calling can be attained only by thoroughgoing and liberal training.

SYNOPSIS OF STUDIES.

GENERAL SCIENTIFIC COURSE.

FRESHMAN YEAR.

First Term.

		Periods per week.	Course number.*
1.	ALGEBRA	2	401
	TRIGONOMETRY	2	411
	ENGLISH	2	1
	CHEMISTRY	4	911
	DRAWING AND LETTERING	2	441*a*, 442
	GERMAN	4	81
	OR		
	FRENCH	4	121
	HYGIENE	1	580

* See pages 94–149.

		Periods per week.	Course number.*
	THE BIBLE	1	221
2.	ALGEBRA AND SOLID GEOMETRY	4	402 & 406 or 407
	ENGLISH	2	1
	GERMAN	4	81
	OR		
	FRENCH	4	121
	HISTORY	2	312
	CHEMISTRY	4	911
	HYGIENE	1	580
	THE BIBLE	1	221
	Second Term.		
1.	ALGEBRA	3	401
	TRIGONOMETRY	2	411
	ENGLISH	2	2
	CHEMISTRY	2	926
	GERMAN	4	82
	OR		
	FRENCH	4	122
	DRAWING AND PROJECTION	2	441*b*, 443*a*
	THE BIBLE	1	222
2.	ALGEBRA	4	403
	ENGLISH	2	2
	CHEMISTRY	2	926
	GERMAN	4	82
	OR		
	FRENCH	4	122
	HISTORY	2	313
	THE BIBLE	1	222
	Third Term.		
1.	ANALYTICAL GEOMETRY AND MENSURATION	5	416 & 421
	ENGLISH	2	3
	CHEMISTRY	2	927

* See pages 94–149

	Periods per week.	Course number.*
GERMAN	4	83
OR		
FRENCH	4	123
DRAWING AND PROJECTION	2	441*c*, 443*b*
THE BIBLE	1	223
2. TRIGONOMETRY	4	412 or 404
ENGLISH	2	3
CHEMISTRY	2	927
GERMAN	4	86
OR		
FRENCH	4	123
HISTORY	2	314
THE BIBLE	1	223

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY 2 AND DIFFERENTIAL CALCULUS 3†	5	417 & 426
OR TRIGONOMETRY OR		413
ANALYTICAL GEOMETRY‡	4	418
ENGLISH	2	14
GERMAN**	2	87
FRENCH**	2	114
OR		
GERMAN***	2	74
FRENCH***	2	127
ENGLISH	2	16
CHEMISTRY.—Analytical Chemistry	2	928
HISTORY	2	321
THE BIBLE	1	224

* See pages 94–149.

† Entered with Mathematics B.

‡ Entered with Mathematics A.

** Entered with German.

*** Entered with French.

	Periods per week.	Course number.*
ELOCUTION	1	53
THEME	1	62
Second Term.		
CALCULUS†	5	427
OR		
ANALYTICAL GEOMETRY‡	4	419
ENGLISH	2	17
CHEMISTRY	2	929
HISTORY	2	322
ANGLO-SAXON	2	10
THE BIBLE	1	225
GERMAN**	2	88
FRENCH**	2	115
OR		
GERMAN***	2	75
FRENCH***	2	128
ELOCUTION	1	54
THEME	1	62
Third Term.		
PHYSICS	4	461
ENGLISH	4	18
BIOLOGY	4	561
CHEMISTRY	2	930
HISTORY	2	323
THE BIBLE	1	226
GERMAN**	2	89
FRENCH**	2	116
GERMAN***	2	76
FRENCH***	2	129

---

* See pages 94–149.

† Entered with Mathematics B.

‡ Entered with Mathematics A.

** Entered with German.

*** Entered with French.

	Periods per week.	Course number.*
ELOCUTION	1	55
THEME	1	62

JUNIOR YEAR.

First Term.

PHYSICS	4	462
HISTORY	2	331
THE BIBLE	1	233
ELOCUTION	1	56
THEME	1	62

ELECTIVES.

GEOLOGY	2	491
ENGLISH A	4	19
ENGLISH	2	41
CHEMISTRY	2	902
BIOLOGY	2	551
BIOLOGY	2	571
FRENCH	2	128
GERMAN	2	90–110
ITALIAN	2	151
SPANISH	2	141
HISTORY OF EDUCATION	2	301

After the First Term, Junior year, the schedule of study for the General Scientific Course is the same as for the Classical Course, except that during the rest of the Junior year the Bible is taken with the Technical students; and German 92, 93; or 95, 96; or 98, 99; or 102, 103; or 105, 106 is substituted for German 75, 76, according to the courses elected in the first term, Junior year. (For schedule of study of the Classical Course see pages 40–47.)

---

* See pages 94–149.

THE CIVIL ENGINEERING COURSE.

The course in Civil Engineering has been designed to develop the mental faculties of the student in those studies which form the foundation of all branches of Technology with additional training in the subjects classed as Civil Engineering. The course also includes such general subjects, essential to a liberal education, as are shown in the synopsis on pages 60–64.

The graduate is prepared for immediate usefulness in the field and office, and, after a moderate amount of professional experience, to fill positions of trust and importance, not only in his chosen profession, but in allied work in mining, mechanical, electrical and architectural engineering.

CIVIL ENGINEERING LABORATORIES AND EQUIPMENT.

The Department has a large equipment of instruments necessary for various branches of engineering field practice, including tapes, compasses, transits, levels, plane tables, barometers, standard base line tapes and pulling apparatus, sextants, solar attachments, chronometers, floats and current meters. A twelve-inch portable alt-azimuth instrument, reading to single seconds by micrometer microscopes, and provided with level for double zenith distances, is used for instruction in Geodesy and Practical Field Astronomy. A precision level of the latest design is employed in instruction in precise leveling.

PARDEE HALL.

The astronomical observatory contains an equatorial telescope, transit, clock, chronograph, meteorological instruments, etc.

For use in the lecture room there are numerous models of the various types of bridge and roof trusses; several complete sets of full-weight standard rolled sections; numerous full-weight sections of riveted joints, representing bridge and boiler work, hand and power riveting; wall charts; working drawings; photographs; slide rules; and lantern, with reflectoscope. The hydraulic lecture room is directly connected with the laboratory, so that its equipment may be used for demonstration purposes before the class.

The Department also has a full-weight pin-connected highway bridge of fifty-feet span and fourteen-feet roadway weighing twelve tons, together with all false work and tools necessary to erect the same.

The GENERAL TESTING LABORATORY contains one transverse machine of 400,000 pounds' capacity for specimens up to twenty-five feet in length and four feet in width, one 200,000-pound, three 100,000-pound screw testing machines and one 60,000-pound hydraulic testing machine arranged for tension, compression and transverse testing; a 4000-pound wire tester and a small machine for testing cord, twine, etc.; a 4000-pound transverse machine for specimens up to sixteen feet, and a smaller transverse machine for specimens up to five feet, arranged with micrometers for measuring deflections, and extension meters for measuring fiber deformations. The laboratory also contains a torsion machine of 125,000 inch-pounds capacity for specimens up to twenty feet in length and a 10,000 inch-pound torsion machine of the pendulum type for short specimens; a number of elongation meters of different types, compressometers and smaller micrometers, hand tools, etc., and apparatus for calibrating machines. There are also a number of special apparatus for shearing, punching, bending, etc., tests.

The CEMENT LABORATORY is fully equipped for conducting routine tests of cement according to the latest specifications together with apparatus for research work. The laboratory contains three 1000-pound machines for tension tests and one 2000-pound machine for compression and tension tests. There is also a machine for moulding briquettes under pressure and a power-driven Boehme hammer, ball mill and an automatic sieving apparatus. Each student is provided with a slate top mixing table and with cement and sand boxes, moist closet and necessary hand tools. The laboratory is further equipped with large immersion tanks with running water, cement bins, briquette racks, moist closets and all necessary apparatus to enable a number of students to work on the same routine tests during the same laboratory period.

The CONCRETE LABORATORY has a large mixing floor; storage bins for stone, sand and cement; a concrete immersion tank to accommodate beams fifteen feet in length; a beam crane and trucks of two tons' capacity; beam, compression and tension moulds; sieves, scales, mixing pans, measures, shovels, etc.

The ROAD MATERIAL LABORATORY contains equipment for performing the abrasion and absorption tests on paving brick (the transverse test of paving brick being performed in the GENERAL TESTING LABORATORY), and equipment for the durability test of road metal. This equipment consists of a brick rattler and a Deval abrasion machine, a drying oven, scales, immersion tanks, sieves, etc.

The HYDRAULIC LABORATORY contains a vertical pressure tank eighteen feet in height and five feet in diameter, arranged for making experiments on the flow of water through orifices and nozzles under heads up to three hundred feet, and provided with a device by which the orifice plates can be removed while the tank is under pressure; other smaller tanks for use under low heads; a standpipe sixty feet high; two tanks, thirty feet long for weir experiments and measurements of quantity; a turbine; impulse wheels; a centrifugal pump run by electric motor and provided with electric measuring instruments; rotary, disc and reciprocating water meters; a Venturimeter; a weighing tank; absolute and differential pressure gauges; and other appliances for the measuring of water used in experiments and for the testing of meters, motors, nozzles and fire hydrants; as well as arrangements for lecture-room illustrations. There is also connected with the laboratory a one-million gallon Worthington duplex pump.

The SHOP contains two lathes, a drill press, a planer, a milling machine, a grinder and other necessary appliances for preparation of test specimens, models and apparatus; and for repair work.

The COLLEGE LIBRARY is well equipped with engineering books and periodicals.

SYNOPSIS OF STUDIES.

CIVIL ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA	2	401
TRIGONOMETRY	2	411
CHEMISTRY	4	911
GERMAN*	4	71 or 81
OR		
FRENCH**	4	111 or 121
ENGLISH	1	1
DRAWING AND LETTERING	2	441*a*–442
THE BIBLE	1	221
HYGIENE AND PHYSICAL CULTURE	1	580

Second Term.

	Periods per week.	Course number.*
ALGEBRA	3	401
TRIGONOMETRY	2	411
CHEMISTRY	2	926
GERMAN	2	72 or 82
OR		
FRENCH	4	112 or 122
ENGLISH	2	2
DRAWING AND PROJECTION	2	441*b*–443*a*
THE BIBLE	1	222

Third Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY	4	416
MENSURATION	1	421
CHEMISTRY	2	927

---

* See pages 94–149.

** If German A and B is offered for entrance, German 81 or French 111 is to be scheduled. If French A and B is offered, French 121 or German 111 is to be scheduled. See page 98.

	Periods per week.	Course number.*
GERMAN	4	73 or 86
OR		
FRENCH	4	113 or 123
ENGLISH	2	3
DRAWING AND PROJECTION	2	441*c*–443*b*
SURVEYING	2	601
THE BIBLE	1	223
SUMMER SCHOOL IN SURVEYING (in vacation) THREE WEEKS		602

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS	3	426
PHYSICS	4	472
DESCRIPTIVE GEOMETRY	$2\frac{1}{3}$	451*a*
SURVEYING	2	603
SHOP WORK	2	1001
THE BIBLE	1	224
THEME	1	62

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS	5	427
PHYSICS	4	473
DESCRIPTIVE GEOMETRY	$2\frac{1}{3}$	451*b*
RAILROADS	2	611
SHOP WORK	2	1001
THE BIBLE	1	225
THEME	1	62

Third Term.

PHYSICS	4	474
DESCRIPTIVE GEOMETRY	$2\frac{1}{3}$	451*c*
MACHINE DRAWING	$1\frac{1}{3}$	452
APPLIED MECHANICS	4	621
RAILROADS	2	612

---

* See pages 94–149.

	Periods per week.	Course number.*
SHOP WORK	2	1001
THE BIBLE	1	226
SUMMER SCHOOL IN SURVEYING (in vacation) THREE WEEKS		613
THEME	1	62,

JUNIOR YEAR.

First Term.

METALLURGY	2	951
CRYSTALLOGRAPHY	2	511
APPLIED MECHANICS	4	622
RAILROADS	3	614
MECHANICS OF MATERIALS	4	623
GENERAL TESTING LABORATORY	2	625
CEMENT	2	651
CEMENT LABORATORY	2	654
ELEMENTS OF ELECTRICAL ENGINEERING	3	804
SPANISH (optional)	2	141
ITALIAN (optional)	2	151
THE BIBLE	1	233
THEME	1	62

Second Term.

STEAM ENGINEERING	3	1023
PETROGRAPHY	2	512
SPANISH (optional)	2	142
ITALIAN (optional)	2	152
MECHANICS OF MATERIALS	4	624
GENERAL TESTING LABORATORY	2	626
ELECTRICAL LABORATORY	2	827
CONCRETE, PLAIN	2	652
CONCRETE (PLAIN) LABORATORY	2	655
RAILROADS	2	615
ROADS AND PAVEMENTS	2	631
ROAD MATERIAL LABORATORY	1	632
THE BIBLE	1	234
THEME	1	62

---

* See pages 94–149.

Third Term.

	Periods per week.	Course number.*
MINERALOGY (systematic)	2	513
SANITARY BIOLOGY	2	561
ASTRONOMY	2	543
SPANISH (optional)	2	143
ITALIAN (optional)	2	153
CONCRETE, REINFORCED	2	653
CONCRETE (REINFORCED) LABORATORY	2	656
MASONRY	2	641
HIGHER SURVEYING	2	604
HYDRAULICS	3	661
HYDRAULIC LABORATORY	1	663
FRAMED STRUCTURES	2	690
ELECTRICAL LABORATORY	2	828
BIBLE	1	235
THEME	1	62

SENIOR YEAR.

First Term.

ENGLISH	2	4
GENERAL GEOLOGY	2	516
ROOFS AND BRIDGES	2	691
ROOF DESIGN	1	694
GRAPHIC STATICS	1	698
HYDRAULICS	3	662
HYDRAULIC FIELD WORK	–	664
MASONRY DESIGN	2	642
SEWERAGE	2	671
SPANISH (optional)	2	144
ITALIAN (optional)	2	154
BIBLE	1	244
THEME	1	62

Second Term.

ECONOMICS	2	371
ENGLISH	2	5

---

* See pages 94–149.

	Periods per week.	Course number.*
GENERAL GEOLOGY	2	517
ROOFS AND BRIDGES	6	692
BRIDGE DESIGN	2	695
SEWERAGE DESIGN	2	672
WATER SUPPLY	3	681
SPANISH (optional)	2	145
ITALIAN (optional)	2	155
BIBLE	1	242–243
THEME	1	62
Third Term.		
ENGLISH	2	6
ROOFS AND BRIDGES	5	693
BRIDGE DESIGN	5	696
WATER SUPPLY DESIGN	2	682
SPANISH (optional)	2	146
ITALIAN (optional)	2	156
THESIS	2	699
BIBLE	1	242–243

* See pages 94–149.

THE MINING ENGINEERING COURSE.

The course leading to the degree of Engineer of Mines (E.M.) is intended to give a general education and to prepare men for positions of responsibility in mining, metallurgy and general engineering. The policy of the Mining Department is to give thorough training in the underlying principles of mathematics, physics, chemistry, mineralogy, geology, metallurgy, surveying, mining engineering, and some practical knowledge in mechanical, civil and electrical engineering. With this fundamental training the mining graduates can successfully carry on specialized work and be rapidly advanced to positions of responsibility.

The training in geology consists of the study of mineralogy, crystallography, petrography, general and economic geology, and the geology of ore deposits.

The course in chemistry consists of lectures, recitations and laboratory work in organic chemistry, qualitative, quantitative and metallurgical analysis, blowpiping and assaying.

The work in the chemical, physical, mineralogical and geological laboratories and the drafting rooms is of a high standard. Although much time is given to the practical training in the laboratories, yet the work in such laboratories is always subordinated to the fundamental and all-important class room work.

The study of Mining proper consists of courses extending throughout the Junior and Senior years and includes: mine surveying and problems, prospecting, deep boring, blasting, quarrying, shaft-sinking, drifting, tunneling, methods of mining and timbering, haulage, winding, ventilation, drainage, mining laws, mine and mill construction, ore dressing, metallurgy, mine machinery and mine administration.

Lafayette College is situated within easy reach of the anthracite coal fields, and magnetic iron mines of Pennsylvania and New Jersey, the zinc and copper mines of New Jersey and extensive quarries of cement rock, slate, serpentine, limestone and sandstone; the Bethlehem Steel Works, and also rolling mills, iron foundries, the Ingersoll-Rand Co., which is one of the largest manufacturers of mine machinery in the world, are located near Easton, and thus the mining students have opportunities of inspecting and studying the practical mining and metallurgical methods.

EQUIPMENT.

The college library contains the important periodicals on mining, metallurgical and engineering, and the transactions of the various engineering societies. A special mining library containing all mining books of value has been created for the convenience of the mining students.

The class room work in mining is illustrated by a large number of lantern slides, wall diagrams, maps of mines, drawings of mine plant and machinery, models of headframes, shafts, square set timbering, rock drills, hammers, picks, blasting apparatus, wire rope, screens, safety lamps, collection of minerals, anemometers, compasses, clinometers, dipping needles, transits, levels, barometers, and all the necessary instruments and equipment in surveying and mapping.

The milling laboratory is a model concentrating plant that is fully equipped to crush, classify, separate and concentrate ores. The equipment consists of a Blake crusher, Cornish rolls, elevators, centrifugal pump, trommels, hydraulic classifiers, spitzkastens, a Wilfley shaking table, a slime table, New Century jigs, and a motor to supply power.

The mine gas analysis laboratory is well equipped to determine quantitatively the various mine gases by both titration and absorption methods.

The equipments of other departments available to the mining students are described in this catalogue as follows:

GENERAL TESTING LABORATORY	57
HYDRAULIC LABORATORY	59
CHEMISTRY AND ASSAYING	88
ELECTRICAL ENGINEERING LABORATORY	74
MECHANICAL ENGINEERING LABORATORY	80

VACATION COURSES.

All students in the mining course are required to take the three weeks' Summer school of surveying at end of Freshman year.

Two weeks in the Spring vacation of Junior and Senior years are spent in an actual mine survey, and in inspecting and studying the practical mining operations. Students are strongly advised to spend at least one Summer vacation during their course in actual work at the mines.

SYNOPSIS OF STUDIES.

MINING ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA	2	401
TRIGONOMETRY	2	411
CHEMISTRY	4	911
GERMAN**	4	71 or 81
OR		
FRENCH**	4	111 or 121
ENGLISH	2	1
DRAWING AND LETTERING	2	441*a*–442
THE BIBLE	1	221
HYGIENE	1	580

Second Term.

	Periods per week.	Course number.*
ALGEBRA	3	401
TRIGONOMETRY	2	411
CHEMISTRY	2	926
GERMAN	4	72 or 82
OR		
FRENCH	4	112 or 122
ENGLISH	2	2
DRAWING AND PROJECTION	2	441*b*–443*a*
THE BIBLE	1	222

Third Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY	4	416
MENSURATION	1	421
CHEMISTRY	2	927

* See pages 94–149.

** If German A and B is offered for entrance, German 81 or French 111 is to be scheduled. If French A and B is offered, French 121 or German 111 is to be scheduled. See page 98.

	Periods per week.	Course number.*
GERMAN	2	73 or 86
OR		
FRENCH	2	113 or 123
ENGLISH	2	3
DRAWING AND PROJECTION	2	441*c*, 443*b*
SURVEYING	2	601
THE BIBLE	1	223
THEME	1	63
SUMMER SCHOOL IN SURVEYING (in vacation) 3 WEEKS	–	602

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS	3	426
CHEMISTRY	2	928
PHYSICS	4	472
SHOP WORK	2	1001
DESCRIPTIVE GEOMETRY	$2^1/_3$	451*a*
THE BIBLE	1	224
THEME	1	62

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS	5	427
CHEMISTRY	2	929
PHYSICS	4	473
SHOP WORK	2	1001
DESCRIPTIVE GEOMETRY	$2^1/_3$	451*b*
THE BIBLE	1	225
THEME	1	62

Third Term.

APPLIED MECHANICS	4	621
CHEMISTRY	2	930
PHYSICS	4	474
DESCRIPTIVE GEOMETRY	$2^1/_3$	451*c*

---

* See pages 94–149.

	Periods per week.	Course number.*
MACHINE DRAWING	$1^1/_3$	452
SHOP WORK	2	1001
THE BIBLE	1	226
THEME	1	62, 63

JUNIOR YEAR.

First Term.

	Periods per week.	Course number.*
APPLIED MECHANICS	4	622
MECHANICS OF MATERIALS	4	623
ELEMENTS OF ELECTRICAL ENGINEERING	3	804
METALLURGY	2	951
CRYSTALLOGRAPHY	2	511
BOILERS	3	1021
SPANISH (optional)	2	141
ITALIAN (optional)	2	151
BIBLE	1	233
THEME	1	62

Second Term.

	Periods per week.	Course number.*
METALLURGY	2	952
MECHANICS AND MATERIALS	4	624
BOILERS	3	1021
ELECTRICAL LABORATORY	2	827
PETROGRAPHY	2	512
MINE SURVEYING	2	701
BIBLE	1	234
THEME	1	62
(Spring vacation mine survey trip.)		
SPANISH (optional)	2	142
ITALIAN (optional)	2	152

Third Term.

	Periods per week.	Course number.*
MINERALOGY	2	513
HYDRAULICS	3	661
ASTRONOMY	2	543
MINING LAW	2	766

---

* See pages 94–149.

	Periods per week.	Course number.*
ELECTRICAL LABORATORY	2	828
DEEP BORING	1	711
DRILLING AND BLASTING	1	716
ORE DRESSING	4	751
STEAM ENGINES	3	1025
BIBLE	1	235
THEME	1	62
SPANISH (optional)	2	143
ITALIAN (optional)	2	153

SENIOR YEAR.

First Term.

ENGLISH	2	4
GENERAL GEOLOGY	2	516
HYDRAULICS	3	662
MINE CONSTRUCTION	2	746
FIELD GEOLOGY	2	523
SHAFT SINKING AND DRIFTING	2	721
MINE EXPLOITATION	2	726
SPANISH (optional)	2	144
ITALIAN (optional)	2	154
BIBLE	1	244
THEME	1	62

Second Term.

GENERAL GEOLOGY	2	517
GEOLOGY OR ORE DEPOSITS	2	521
ASSAYING	2	955
MINE CONSTRUCTION	2	747
MINE VENTILATION	3	736
MINE MACHINERY	2	756
ECONOMICS	2	371
ENGLISH	2	5
BUSINESS LAW (optional)	2	363
SPANISH (optional)	2	145

* See pages 94–149.

	Period per week.	Course number.*
ITALIAN (optional)	2	155
BIBLE	1	242–43
THEME	1	62

(Spring vacation mine inspection trip.)

Third Term.

	Period per week.	Course number.*
PETROGRAPHY	2	512
GEOLOGY OF ORE DEPOSITS	2	522
MINE CONSTRUCTION	2	748
ORE DRESSING	4	751
MINE DRAINAGE	3	741
MINING LAW	2	766
MINE ADMINISTRATION	2	766
MINE HAULING AND HOISTING	3	731
BUSINESS LAW (optional)	2	364
ENGLISH	2	6
SPANISH (optional)	2	146
ITALIAN (optional)	2	156
BIBLE	1	242–43
THESIS	2	771

* See pages 94–149.

THE ELECTRICAL ENGINEERING COURSE.

The object of the course in Electrical Engineering is to give thorough instruction in such branches of engineering, both general and electrical, as shall fit the graduate to successfully meet and solve the problems which come to him as practicing electrical engineer. To this end, stress is laid on the attainment of a broad engineering and scientific training rather than on the specialization along any particular line or lines of Electrical Engineering. The aim is to train neither specialists nor artisans, but to give such instruction as shall enable the engineer to build up from the foundation of his knowledge of basic principles such specialized knowledge or reasoning as may be required to successfully meet the problem arising for solution.

The Freshman and Sophomore years are devoted to general instructional and culture courses. Thorough training is given in Mathematics, and Physics is taken throughout the Sophomore year, additional hours in elementary electricity and magnetism being given to the students from the Department of Electrical Engineering so that they may be especially prepared to take up successfully their particular line of training during the last two years of their course.

Beginning with the second term of the Sophomore year, the fundamental principles of Electrical Engineering are studied in the class room and worked out in the laboratory, the design room, and in problem work. The aim has been to so arrange these several lines that they shall be mutually supplemental and thus give the student a clear, general conception of the principles involved, their correlation and relative importance.

The plan is continued throughout the Senior year as well, attention now being paid to the direct application of the theories and principles thus arrived at, to the various phases of present-day commercial practice, consideration being given to the financial and commercial as well as the engineering side.

The graduate is in this way prepared to take up in an effective and intelligent manner any branch of electrical engineering requiring general or special electrical training.

ELECTRICAL ENGINEERING LABORATORIES AND EQUIPMENT.

The laboratories are large and well arranged. The main electrical laboratory is thirty by sixty feet in dimensions, and is fitted up with representative types of continuous and alternating current generators and motors, lamp-banks, water rheostats, brakes, etc.; and the necessary instruments are supplied for loading and testing generators and motors.

The laboratories are supplied from the Easton Power Company's station, with two-phase, alternating current, at a frequency of sixty cycles. This current is available for testing purposes.

A fifty kilowatt motor-generator set has been installed for the purpose of supplying the laboratories with direct current. This set consists of a seventy-five horse power induction motor, directly connected to two twenty-five kilowatt, 120-volt direct current dynamos, the current from which is supplied to the laboratories by means of the three-wire system.

In case of need, direct curent from the plant of the Easton Power Company is also available.

While designed primarily as a source of direct current, this motor-generator set is so installed as to be available at all times for experimental tests by the students.

A portion of the laboratories is fitted up for the more delicate tests required. This consists of two rooms, each being about twenty-two feet square, containing the necessary instruments for accurate testing, among which are a Leeds and Northup Potentiometer, a Thompson Quadrant Electrometer, D'Arsonval Galvanometers, Wheatstone Bridges, condensers, etc. Particular attention is paid to photometry of electric illuminants and specially fitted rooms have been provided for this work.

SYNOPSIS OF STUDIES.

ELECTRICAL ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA	2	401
TRIGONOMETRY	2	411
CHEMISTRY	4	911
GERMAN**	4	71 or 81
OR		
FRENCH	4	111 or 121

---

* See pages 94–149.

** If German A or B is offered for entrance, German 81 or French 111 is to be scheduled. If French A or B is offered, French 121 or German 111 is to be scheduled. See page 98.

	Periods per week.	Course number.*
ENGLISH	2	1
DRAWING AND LETTERING	2	441*a*–442
THE BIBLE	1	221
HYGIENE	1	580

Second Term.

ALGEBRA	3	401
TRIGONOMETRY	2	411
CHEMISTRY	2	926
GERMAN	4	72 or 82
OR		
FRENCH	4	112 or 122
ENGLISH	2	2
DRAWING AND PROJECTION	2	441*b*, 443*a*
THE BIBLE	1	222

Third Term.

ANALYTICAL GEOMETRY	4	416
MENSURATION	1	421
CHEMISTRY	2	927
GERMAN	4	73 or 86
OR		
FRENCH	4	113 or 123
ENGLISH	2	3
DRAWING AND PROJECTION	2	441*c*, 443*b*
SURVEYING	2	601
THE BIBLE	1	223
THEME	1	63

SOPHOMORE YEAR.

First Term.

ANALYTICAL GEOMETRY	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS	3	426

---

* See pages 94–149.

	Periods per week.	Course number.*
SHOP WORK	2	1001
DESCRIPTIVE GEOMETRY	$2^{1}/_{3}$	451*a*
PHYSICS	6	472, 475
THE BIBLE	1	224
THEME	1	62

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS	5	427
DESCRIPTIVE GEOMETRY	$2^{1}/_{3}$	451*b*
PHYSICS	4	473
ELEMENTS OF ELECTRICAL ENGINEERING	2	476
SHOP WORK	2	1001
THE BIBLE	1	225
THEME	1	62

Third Term.

DESCRIPTIVE GEOMETRY	$2^{1}/_{3}$	451*c*
MACHINE DRAWING	$1^{1}/_{3}$	452
PHYSICS	4	474
ELEMENTS OF ELECTRICAL ENGINEERING	2	477
APPLIED MECHANICS	4	621
SHOP WORK	2	1001
THE BIBLE	1	226
THEME	1	62, 63

JUNIOR YEAR.

First Term.

APPLIED MECHANICS	4	622
MECHANICS OF MATERIALS	4	623
ALTERNATING CURRENT ENGINEERING	3	811
ELECTRICAL LABORATORY	2	821
ENGINEERING ABSTRACTS	1	831
SHOP WORK	2	1001
STEAM BOILERS	3	1021
SPANISH (optional)	2	141
ITALIAN (optional)	2	151

---

* See pages 94–149.

	Periods per week.	Course number.*
THE BIBLE	1	233
THEME	1	62
Second Term.		
MECHANICS OF MATERIALS	4	624
ALTERNATING CURRENT ENGINEERING	3	812
ELECTRICAL LABORATORY	2	822
ENGINEERING ABSTRACTS	1	831
MOTOR ENGINEERING	3	851
SHOP WORK	2	1001
STEAM BOILERS	3	1021
SPANISH (optional)	2	142
ITALIAN (optional)	2	152
THE BIBLE	1	234
THEME	1	62
Third Term.		
DIFFERENTIAL EQUATIONS	3	437
HYDRAULICS	3	661
ELECTRICAL LABORATORY	2	823
ENGINEERING ABSTRACTS	1	831
ILLUMINATING ENGINEERING	3	852
SHOP WORK	2	1001
STEAM ENGINEERING	3	1023
SPANISH (optional)	2	143
ITALIAN (optional)	2	153
THE BIBLE	1	235
THEME	1	62

SENIOR YEAR.

First Term.

ENGLISH	2	4
HYDRAULICS	3	662
ELECTRICAL POWER TRANSMISSION	4	861
ELECTRICAL LABORATORY	2	824
ENGINEERING ABSTRACTS	1	831

---

* See pages 94–149.

	Periods per week.	Course number.*
ELECTRICAL DESIGN	2	841
THERMODYNAMICS	4	1024
SPANISH (optional)	2	144
ITALIAN (optional)	2	154
THE BIBLE	1	244
THEME	1	62

Second Term.

	Periods per week.	Course number.*
ENGLISH	2	5
BUSINESS LAW	2	363
ECONOMICS	2	371
ELECTRICAL LABORATORY	2	825
ENGINEERING ABSTRACTS	1	831
ELECTRICAL DESIGN	2	842
ELECTRICAL POWER STATIONS	3	871
THERMODYNAMICS	3	1024
SPANISH (optional)	2	145
ITALIAN (optional)	2	155
THE BIBLE	1	242–43
THEME	1	62

Third Term.

	Periods per week.	Course number.*
ENGLISH	2	6
ELECTRICAL LABORATORY	2	826
ENGINEERING ABSTRACTS	1	831
ELECTRICAL RAILWAY ENGINEERING	5	853
HYDRO-ELECTRIC ENGINEERING	4	872
SPANISH (optional)	2	146
ITALIAN (optional)	2	156
THESIS WORK	2	891
THE BIBLE	1	242–43
GRADUATION THESIS.		

* See pages 94–149.

THE MECHANICAL ENGINEERING COURSE.

The course in Mechanical Engineering aims to equip the student to handle general engineering problems. Courses in class room, drawing room, shops and laboratories, aim to give the student practice in the work that engineers are called on to perform, to enable him to base his work on principles and not on empirical formulae, and to give him the theory and practice necessary to deal intelligently with other men.

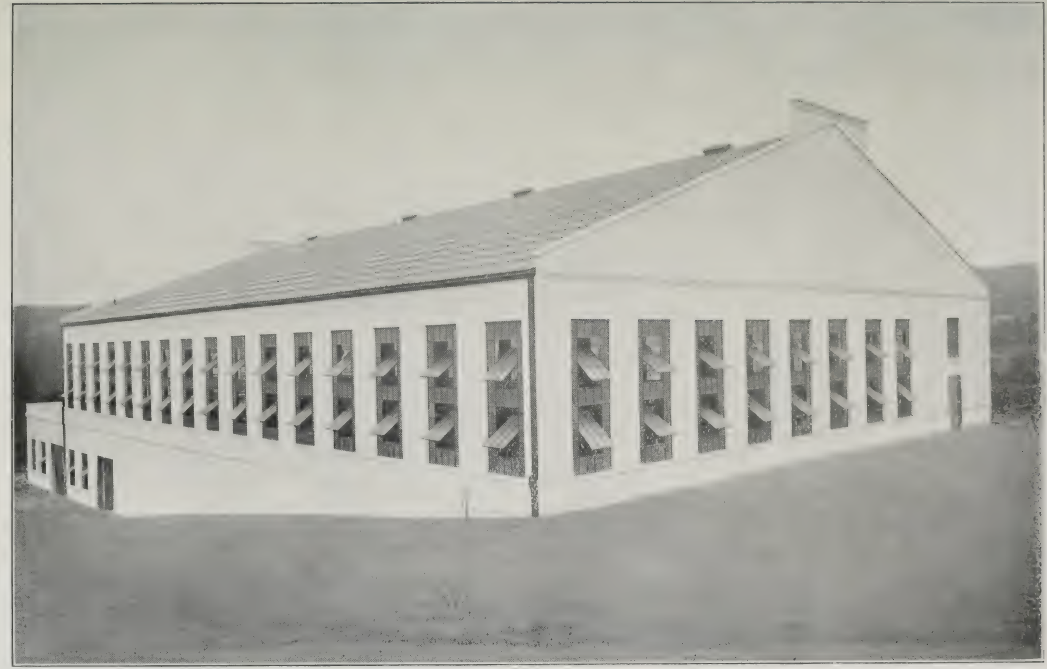
The recitation work of the Department begins with the study of Mechanism, and courses in valve gears, mechanisms of modern machine tools, boilers, steam engines, turbines, gas engines, thermodynamics, etc., are given in their turn. A course in machine design is given with the object of applying the principles already learned.

The work in the shops is given with the idea of teaching engineering principles and not manual training. Each student is required to keep the actual cost of every job assigned to him, a rate for his time being assumed.

The work in the Engineering Laboratory will be given with the object of drilling the student in the experimental work which the engineer is called on to perform, as boiler, pump, engine tests, etc.

MECHANICAL ENGINEERING LABORATORIES AND EQUIPMENT.

The new Shop and Steam Laboratory is 102 feet wide,



MECHANICAL ENGINEERING LABORATORY AND SHOP.

183 feet long, and 40 feet from floor to peak of roof, and is constructed entirely of concrete, steel, brick, and glass, making a light, airy building, absolutely fireproof. Two partitions 8 feet high extend down the center of the large room, forming a passageway, to the left of which is the pattern and machine shop, and to the right the steam laboratory and instructors' offices. At the back of these are the forge shop, the foundry, and the boiler room, connected with each of which is a storage room for the material to be used, and a coal bunker. A large toilet room, supplied with hot and cold water and fitted with individual lockers, is provided in the basement for the convenience of the students.

The pattern shop is completely equipped with benches, lathes, band saw, circular saw, planer, etc., and all the accessories necessary in an efficient shop.

The foundry is supplied with a cupola, a soft metal furnace, a core oven, ladles, flasks, and all tools necessary to make moulds and turn out practical castings in brass or iron. A large bull-ladle of a capacity equal to that of the cupola is kept under the tap-spout at all times, that in case there should be a break at the breast no molten iron can spatter upon the floor and endanger the men.

The forge shop is equipped with student forges, all of the down-draft type, and a gas forge, anvils, and all of the tools used for the shaping and welding of metals by this process.*

The machine shop is fully equipped with vise benches for hand work, lathes, planers, shapers, milling machines, drill presses, power saw, grinding machine, and all small tools to go with each of the machines. All are motor-driven, and direct-connected wherever possible, making a light shop, eliminating the danger of belts, and also furnishing a convenient means for testing any of the machines, or tools of various makes of steel, under different conditions of operation. The gears are encased to give greater safety to the operator.

---

* In connection with the forge shop there is a sheet metal and pipe shop equipped with the necessary tools to give instruction in sheet metal and pipe work.

The steam laboratory is to be equipped with standard types of steam engines installed to run condensing or non-condensing. Injectors, pumps, steam turbines, gas engines, and all instruments required for complete tests will be furnished. The boiler room will contain a fire tube and a water tube boiler, to furnish steam for the laboratory, and also to provide a convenient plant for instruction in firing, operating, and testing boilers.

All of the equipment is of full practical size of standard make, most modern design, and of a type that offers the greatest educational advantages. Every care has been taken to make all of the equipment as safe as possible for the inexperienced student. Certain machines may be used only under the direct supervision of an instructor.

SYNOPSIS OF STUDIES.

MECHANICAL ENGINEERING COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA	2	401
TRIGONOMETRY	2	411
CHEMISTRY	4	911

---

* See pages 94–149.

	Periods per week.	Course number.*
GERMAN**	4	71 or 81
OR		
FRENCH**	4	111 or 121
ENGLISH	2	1
DRAWING AND PROJECTION	2	441*a*–442
BIBLE	1	221
HYGIENE	1	580

Second Term.

ALGEBRA	3	401
TRIGONOMETRY	2	411
CHEMISTRY	2	926
GERMAN	4	72 or 82
OR		
FRENCH	4	112 or 122
ENGLISH	2	2
DRAWING AND PROJECTION	2	441*b*–443*a*
BIBLE	1	222

Third Term.

ANALYTICAL GEOMETRY	4	416
MENSURATION	1	421
CHEMISTRY	2	927
GERMAN	4	73 or 86
OR		
FRENCH	4	113 or 123
ENGLISH	2	3
DRAWING AND PROJECTION	2	441*c*–443*b*
SURVEYING	2	601
BIBLE	1	223
THEME	1	63

* See pages 94–149.

** If German A and B is offered for entrance, German 81 or French 111 is to be scheduled. If French A and B is offered, French 121 or German 111 is to be scheduled. See page 98.

SOPHOMORE YEAR.

First Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS	3	426
PHYSICS	4	472
DESCRIPTIVE GEOMETRY	$2^1/_3$	451*a*
MECHANISM	2	1011
SHOP WORK	2	1001
BIBLE	1	224
THEME	1	62

Second Term.

DIFFERENTIAL AND INTEGRAL CALCULUS	5	427
PHYSICS	4	473
DESCRIPTIVE GEOMETRY	$2^1/_3$	451*b*
MECHANISM—VALVE GEARS	2	1011
SHOP WORK	2	1001
BIBLE	1	225
THEME	1	62

Third Term.

DIFFERENTIAL EQUATIONS	2	437
PHYSICS	4	474
DESCRIPTIVE GEOMETRY	$2^1/_3$	451*c*
MACHINE DRAWING	$1^1/_3$	452
APPLIED MECHANICS	4	621
MECHANISM	2	1011
SHOP WORK	2	1001
BIBLE	1	226
THEME	1	62, 63

JUNIOR YEAR.

First Term.

APPLIED MECHANICS	4	622
MECHANICS OF MATERIALS	4	623
ELEMENTS OF ELECTRICAL ENGINEERING	3	804
BOILERS	3	1021

---

* See pages 94–149.

	Periods per week.	Course number.*
SHOP WORK	2	1001
METALLURGY	2	951
SPANISH (optional)	2	141
ITALIAN (optional)	2	151
BIBLE	1	233
THEME	1	62

Second Term.

MECHANICS OF MATERIALS	3	624
ELECTRICAL LABORATORY	2	827
BOILERS	3	1021
SANITARY BIOLOGY	2	
SHOP WORK	2	1001
METALLURGY	2	952
SPANISH (optional)	2	142
ITALIAN (optional)	2	152
BIBLE	1	234
THEME	1	62

Third Term.

HYDRAULICS	3	661
FRAMED STRUCTURES	2	690
ELECTRICAL LABORATORY	2	828
STEAM ENGINES	3	1025
ENGINEERING ABSTRACTS	2	1073
SHOP WORK	2	1001
SPANISH (optional)	2	143
ITALIAN (optional)	2	153
BIBLE	1	235
THEME	1	62

SENIOR YEAR.

First Term.

ENGLISH	2	4
GRAPHIC STATICS	1	698
HYDRAULICS	3	662

---

* See pages 94–149.

	Periods per week.	Course number.*
ROOFS AND BRIDGES	2	691
MACHINE DESIGN	3	1012
THERMODYNAMICS	4	1024
INDUSTRIAL MANAGEMENT	2	1061
SPANISH (optional)	2	144
ITALIAN (optional)	2	154
BIBLE	1	244
THEME	1	62
Second Term.		
ECONOMICS	2	371
ENGLISH	2	5
BUSINESS LAW	2	363
THERMODYNAMICS	3	1024
TURBINES	3	1022
MACHINE DESIGN	3	1012
SPANISH (optional)	2	145
ITALIAN (optional)	2	155
BIBLE	1	242–43
THEME	1	62
Third Term.		
HEATING AND VENTILATION	4	1051
TURBINES	3	1022
MACHINE DESIGN	3	1012
DYNAMICS OF MACHINES	2	1013
ENGLISH	2	6
SPANISH (optional)	2	146
ITALIAN (optional)	2	156
THESIS	2	1072
BIBLE	1	242–43

* See pages 94–149.

THE CHEMICAL COURSE.

The aim of this course, which leads to the Degree of Bachelor of Science in Chemistry, is to fit young men as chemical engineers for practical work in chemistry, either as chemists in iron and steel works, in manufacturing establishments, or as chemical manufacturers. Great attention is paid to analytical chemistry, and especially to the chemistry of cement and the chemistry and metallurgy of iron and steel. Graduates are fitted to take paid positions as chemists immediately upon graduation. For men of the proper character immediate and remunerative employment can be secured. This course will also be found an excellent preparation for the study of medicine.

Those who take the Chemical Course receive the same instruction in mathematics, drawing, shop-work, modern languages, physics and elementary chemistry up to and including elementary quantitative analysis during Freshman and Sophomore years as the engineering students.

During Junior and Senior years the courses diverge. Those especially interested in metallurgy and in the chemistry of cements and ceramics receive most of their instruction from Professors Hart and Wysor. Those interested in Organic Chemistry are in charge of Professor Hart and Mr. Ross. Those interested in Physical Chemistry are instructed by Mr. De Long with the coöperation of Professor Gordon, of the Department of Physics. Those who expect to be Chemical Engineers are advised by Professors Hart and Wysor with the assistance of Professor Rood, of the Engineering Department, while those interested in tanning will receive instruction from Professor Hart and Mr. Ross with the coöperation of Professor Davison, of the Department of Biology.

Provision is made for new courses as the need arises. This is possible because the instruction is mainly individual and suited to the needs of each student.

While the instruction centers in the two branches of Chemistry and Metallurgy, the course aims to supply a thorough education along the lines most necessary for a successful career as a responsible chemist.

CHEMICAL AND METALLURGICAL LABORATORIES AND EQUIPMENT.

The Chemical and Metallurgical laboratories are contained in Gayley Hall, a fire-proof structure built for the use of this Department. There are four large and four smaller laboratories and a shop, besides three stock rooms, two balance rooms, two quiz rooms, a lecture room, a room containing the museum and the books of the Henry W. Oliver Chemical and Metallurgical Library, and three rooms for instructors.

The two balance rooms adjoin the quantitative laboratory, and one of them may be entered from the qualitative laboratory.

Two large laboratories each have desk room for 48 students. The qualitative laboratory has desk room for 88 students and the beginners' laboratory for 232. Water and gas are supplied to each student, and each room is

GAYLEY LABORATORY OF CHEMISTRY AND METALLURGY.

supplied with air blast and electric current. They are well lighted, and heated by steam. The smaller laboratories are arranged for assaying, industrial work, gas analysis, microscopic and photographic work, and various other determinations made with the polariscope, spectroscope, calorimeter, etc. For this and other work properly belonging to the department, there is an adequate equipment.

SYNOPSIS OF STUDIES.

CHEMICAL COURSE.

FRESHMAN YEAR.

First Term.

	Periods per week.	Course number.*
ALGEBRA	2	401
TRIGONOMETRY	2	411
CHEMISTRY	4	911
GERMAN		71 or 81
OR		
FRENCH**	4	111
ENGLISH	2	1
DRAWING AND LETTERING	2	441*a*–442
THE BIBLE	1	221
HYGIENE	1	580

Second Term.

	Periods per week.	Course number.*
ALGEBRA	3	401
TRIGONOMETRY	2	411
CHEMISTRY	2	912
GERMAN	4	72 or 82
OR		
FRENCH	4	112

---

* See pages 94–149.

** Only in case three years of preparatory German is accepted. See page 98.

	Periods per week.	Course number.*
ENGLISH	2	2
DRAWING AND PROJECTION	2	441*b*–443*a*
THE BIBLE	1	222

Third Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY	4	416
MENSURATION	1	421
CHEMISTRY	2	913
GERMAN	4	73 or 86
OR		
FRENCH	4	113
ENGLISH	2	3
DRAWING AND PROJECTION	2	441*c*–443*b*
THE BIBLE	1	223
THEME	1	63

SOPHOMORE YEAR.

First Term.

	Periods per week.	Course number.*
ANALYTICAL GEOMETRY	2	417
DIFFERENTIAL AND INTEGRAL CALCULUS	3	426
CHEMISTRY	6	914
PHYSICS	4	472
SHOP WORK	2	1001
THE BIBLE	1	224
THEME	1	62

Second Term.

	Periods per week.	Course number.*
DIFFERENTIAL AND INTEGRAL CALCULUS	5	427
CHEMISTRY	6	915
PHYSICS	4	473
SHOP WORK	2	1001
THE BIBLE	1	225
THEME	1	62

Third Term.

	Periods per week.	Course number.*
CHEMISTRY	6	916
PHYSICS	4	474

---

* See pages 94–149.

	Periods per week.	Course number.*
CHEMICAL ARITHMETIC	3	917
SHOP WORK	2	1001
THE BIBLE	1	226
THEME	1	62, 63

JUNIOR YEAR.

First Term.

CRYSTALLOGRAPHY	2	511
QUANTITATIVE ANALYSIS	5	918
THEORETICAL CHEMISTRY	2	919
ORGANIC CHEMISTRY	4	920
METALLURGY	2	951
TECHNICAL GERMAN	1	961
SPANISH (optional)	2	141
ITALIAN (optional)	2	151
BIBLE	1	233
THEME	1	62

Second Term.

PETROGRAPHY	2	512
QUANTITATIVE ANALYSIS	5	931
THEORETICAL CHEMISTRY	2	924
ORGANIC CHEMISTRY	4	921
METALLURGY	2	952
TECHNICAL GERMAN	1	962
SPANISH (optional)	2	142
ITALIAN (optional)	2	152
BIBLE	1	234
THEME	1	62

Third Term.

QUANTITATIVE ANALYSIS	4	932
THEORETICAL CHEMISTRY	2	925
ORGANIC CHEMISTRY	4	922
MINERALOGY	3	513
SANITARY BIOLOGY	2	561

* See pages 94–149.

	Periods per week.	Course number.*
TECHNICAL GERMAN	1	963
SPANISH (optional)	2	143
ITALIAN (optional)	2	153
BIBLE	1	235
THEME	1	62

SENIOR YEAR.

First Term.

	Periods per week.	Course number.*
QUANTITATIVE ANALYSIS	10	933
CHEMICAL ENGINEERING	2	934
GEOLOGY	2	516
ENGLISH	2	4
TECHNICAL GERMAN	1	964
SPANISH (optional)	2	144
ITALIAN (optional)	2	154
BIBLE	1	244
THEME	1	62

Second Term.

	Periods per week.	Course number.*
ANALYTICAL CHEMISTRY (Thesis Work)	4	971
CHEMICAL TECHNOLOGY	2	935
ASSAYING	2	955
GEOLOGY	2	517
ECONOMIC GEOLOGY	2	521
ECONOMICS	2	371
ENGLISH	2	5
TECHNICAL GERMAN	1	965
SPANISH (optional)	2	145
ITALIAN (optional)	2	155
BIBLE	1	242–43
THEME	1	62

Third Term.

	Periods per week.	Course number.*
ANALYTICAL CHEMISTRY (Thesis Work)	12	972
ECONOMIC GEOLOGY	2	521

---

* See pages 94–149.

	Periods per week.	Course number.*
TECHNICAL GERMAN	1	966
ENGLISH	2	6
SPANISH (optional)	2	146
ITALIAN (optional)	2	156
BIBLE	1	242–43

* See pages 94–149.

COURSES.

ENGLISH LANGUAGE, ENGLISH LITERATURE, COMPARATIVE PHILOLOGY.

Professors F. A. March, Jr., J. W. Tupper, and Messrs. Hutchins, Knowlton, Aston and Bierstadt.

The work in this department aims, first, to train the student in speaking and writing English correctly. This training begins with the theme work in the Freshman year and is continued throughout the course.

The work in the upper classes is divided into the study of the language and the study of the literature. Its purpose is the interpretation of masterpieces, the rethinking of the thoughts of master minds. The study of the language consists of a study of the principles of grammar, rhetoric, etymology, phonetics, prosody, and other material of philological investigation according to the progressive course outlined in Dr. March's Method of philological Study of the English Language and the application of the results of such work to the text of some standard author. Bunyan, Spenser, Chaucer, Shakespeare, Bacon and Milton are taken up in this way, and courses in the English Novel and the Short Story are given associated with an examination of the language of selected novels and short stories. This course ends with the study of Dr. Whitney's Lectures on Language.

The work in English Literature consists of a course of lectures beginning with the Elizabethan period and continuing down to the present time. The course extends over the Junior and Senior years and is accompanied by special reading and by weekly and term reports.

Dr. March's Anglo-Saxon Grammar and Reader is used as the basis for a course in Anglo-Saxon given in connection with the study of the English Language.

For training in speaking and writing English correctly every student is required to hand in two themes in every term in his College course after Freshman year. Many of them are read in class and criticized as time allows. In this work professors of all departments take part. It is desired that students in each department shall write on subjects connected with it in the words and phrases current among experts, and know the precise meaning of these words and phrases. In these matters the professors in each department are authorities.

1–2–3. COMPOSITION. Themes. Conferences every two weeks. Outside reading. First, second and third terms, Freshman year. Two periods per week.

4–5–6. ENGLISH FOR ENGINEERS AND CHEMISTS.—Recitations based on Sypherd's *Handbook of English for Engineers*, discussions of articles in the technical journals, especially *The Engineering News* and *Power*, and the writing of weekly themes on subjects of a technical nature. First, second, and third terms, Senior year. Two hours per week.

10. ANGLO-SAXON.—Anglo-Saxon Grammar and Reader. Second term, Sophomore year. Two periods per week.

11–12–13. ADVANCED ANGLO-SAXON.—Preparation: **10.** March's Anglo-Saxon Grammar and Reader and additional reading as assigned. Gilbert prize in Old English (see page 184). First, second and third terms, Junior or Senior year. One period per week.

14. English Language.—Trench on the study of Words. Trench Prize (see page 182). First term, Sophomore year. Two periods per week.

16. English Language.—Bunyan's Pilgrim's Progress, English Syntax, Rhetorical Forms, Grammatical Equivalents, Essays on Bunyan's Life, Times and Works. First term, Sophomore year. Two periods per week.

17. English Language.—Spenser's Faery Queen, Etymology, Romance of Chivalry, Spenserian Stanza, Essays on Spenser's Life, Times and Works. Second term, Sophomore year. Two periods per week.

18. English Language.—Chaucer's Canterbury Tales. Phonetics Orthographic Forms, Essays on Chaucer's Life, Times and Works. Lounsbury Prize (see page 182). Third term, Sophomore year. Three or four periods per week according to course taken.

19. English Language.—Shakespeare. Lectures, Weekly Essays on Shakespeare's Life, Times and Works. Two periods per week. Francis Bacon: Study of the Essays. Lectures, Weekly Essays on Bacon's Life, Times and Works. First term, Junior year. Two periods per week.

20. English Language.—Shakespeare. Study of Hamlet and other Shakespearean Tragedies. Two periods per week. John Milton: Study of His Poetic Works. Weekly Essay on Milton's Life, Times and Works. Second term, Junior year. Two periods per week.

21. English Language.—Study of As You Like It and other Shakespearean Comedies. Lectures, Weekly reports, Dramatic Criticism. Shakespeare Prize (see page 185). Two periods per week. Oliver Wendell Holmes. Lectures on American literature, Essays and Reports on Holmes's Times and Works. Third term, Junior year. Two periods per week.

22. English Language.—English Fiction. Lectures, Assigned Reading, Book Criticism, Weekly Essays. Two periods per

week. Rudyard Kipling. Essays on Kipling's Times and Works. The Francis A. March Prize (see page 181.) First term, Senior year. Two periods per week.

23. ENGLISH LANGUAGE.—The Short Story. Lectures and required reading. Two periods per week. English Fiction (continued). Second term, Senior year. Two periods per week.

24. ENGLISH LANGUAGE.—The Short Story (continued). Two periods per week. English Fiction (concluded). Third term, Senior year. Two periods per week.

30 31. COMPARATIVE PHILOLOGY.—Whitney's Language and the Study of Language. Third term, Senior year. Three periods per week.

41 42. ENGLISH LITERATURE.—Lectures on the drama from its beginning till the closing of the theaters in 1642. Weekly reports, assigned reading. First and second terms, Junior and Senior years. Four periods per week.

43. ENGLISH LITERATURE.—Lectures on the drama from the Restoration to Sheridan. Weekly reports, assigned reading. Third term, Junior and Senior years. Four periods per week.

44–46. ENGLISH LITERATURE.—Lectures on the literature of the seventeenth and eighteenth centuries exclusive of the drama. Weekly reports, assigned reading. Four hours per week throughout the Junior and Senior years.

In connection with **43** and **46** a course in Metrics is given to the Juniors during the Senior vacation.

41–42–43. Given in 1914–15.

44–45–46. Given in 1915–16.

Courses **10** to **40**, Professor March.

Courses **1** to **6**, **41** to **46**, Professor Tupper.

ELOCUTION.

Professor March, Jr., and Mr. Aston.

51–52. ELOCUTION.—Delivering of selected pieces. Required in the Classical and Latin Scientific Courses. Optional in all others. Second and third terms, Freshman year.

53–54–55. ELOCUTION.—Delivering of selected pieces. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. First, second and third terms, Sophomore year.

56–57–58. ELOCUTION.—Delivering of original addresses on chosen subjects. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. First, second and third terms, Junior year.

59–60. ELOCUTION.—Delivering of unwritten addresses on current events, followed by class discussion. Required in the Classical, Latin Scientific and General Scientific Courses. Optional in all others. First and second terms, Senior year.

61. ELOCUTION.—Graduating Orations. Required in the Classical, Latin Scientific and General Scientific Courses. By special appointment in all others. Third term, Senior year.

THEME.

62. Every student is required to hand in each term a theme upon a subject assigned by one of the departments.

63. Every technical student who does not take the Summer School in Surveying, or other equivalent work, is required to present a Theme, typewritten upon sheets 8 x $10^1/_2''$ in size, upon a subject approved by the head of his department, on or before the Monday following the opening day of each fall term.

MODERN LANGUAGES.

Professors Fehr and Hopkins, and Messrs. Gable, Schwarz and Klaessig.

In the engineering courses either French or German is scheduled for the entire Freshman year, as the entering student may elect. If German A and B is offered for entrance, German 81 or French 111 is to be scheduled. If French A and B is offered for entrance, French 121 or German 111 is to be scheduled. A decision for either language must be filed by the candidate for admission with the registrar not later than the opening day, otherwise an assignment will be made at the discretion of the College authorities.

In the Chemical Course German is required in the Freshman year. If, however, any student offers satisfactory evidence of a three years' course in some preparatory or high school of the first class, he may take French 111 or 121.

All courses from 90 to 110 are offered only upon the application of at least four students, providing the teaching force is available, and providing the application is filed with the head of the department during the preceding term.

GERMAN.

71-72-73. ELEMENTARY GERMAN.—Prescribed for all Freshmen in the Chemistry course and elective for all other technical students who in both cases offer French for entrance.

Thorough drill in pronunciation and in the essentials of grammar and syntax. Prose composition. Extensive sight reading. Easy prose is selected for reading.

First, second and third terms, Freshman year. Four periods per week.

74-75-76. ELEMENTARY GERMAN.—Prescribed for Sophomores in Latin Scientific and General Scientific courses who have offered French for entrance, and for the Juniors in the Classical course.

Thorough drill in pronunciation and in the essentials of grammar and syntax. Prose composition. Sight-reading. Easy German prose is read.

First, second and third terms. Two periods per week.

77-78-79. INTERMEDIATE GERMAN.—Preparation: 76. Elective for Seniors in the Classical course, and for Juniors in the Latin

Scientific and General Scientific courses who offered French for entrance. Prose composition and rapid reading from modern writers as Riehl, Wildenbruch, Storm, etc. Practice in sight-reading is emphasized. First, second and third terms. Two periods per week.

81–82. ADVANCED GERMAN.—Preparation: Entrance German B. Elective for Freshman technical students and prescribed for Freshman in the Latin Scientific and General Scientific courses, who have offered German for entrance.

Rapid review of the essentials of grammar and syntax. Advanced prose composition. Aural drill. The reading of advanced texts from writers such as Freytag, Sudermann, Jahn, Scheffel, etc.

First and second terms, Freshman year. Four periods per week.

86. SCIENTIFIC GERMAN.—Preparation: 82. Prescribed for all the Freshmen in the technical, Latin Scientific and General Scientific courses who enter on German and continue with German 81.

An introduction to technical literature.

Third term, Freshman year. Four periods per week.

87–88–89. NINETEENTH CENTURY WRITERS.—Preparation: 82. Prescribed for Sophomores in the Latin Scientific and General Scientific courses who entered on German. Advanced prose composition.

First, second and third terms, Sophomore year. Two periods per week.

91–92–93. SCHILLER AND GOETHE.—Preparation: 76 or 89. Elective for Juniors and Seniors in the Classical, Latin Scientific and General Scientific courses. The lives and several of the principal works of these authors will be studied.

This course will be offered to the Juniors and Seniors together. Professor Fehr. First, second and third terms, in the year 1916–17.

94–95–96. GOETHE'S FAUST.—Preparation: 76 or 89. A critical study of the drama with special reference to the ethical problems involved and to the author's life. This course will be offered to Juniors and Seniors together in the year 1915–16. Professor Fehr.

First, second and third terms.

97–98–99. GRILLPARZER AND HIS WORKS.—Preparation: 76 or 89. Considered with special reference to the conflict between art and life that so much occupied his attention. Elective. Professor Fehr.

First, second and third terms. Two periods per week.

100. GOETHE'S *Iphigenie* AND *Tasso*.—Preparation: 76 or 89. A study of the conflict between art and life as treated by the author. Elective. Professor FEHR.

Second term. Two hours per week.

101–102–103. HISTORY OF GERMAN LITERATURE.—Preparation: 76 or 89. Text-book: Francke or Robertson. The most important movements in the evolution of German literary life are studied. Elective. Professor FEHR.

First, second and third terms. Two hours per week.

104–105–106. MIDDLE HIGH GERMAN.—Preparation: 76 or 89. Text-books: Paul's *Mittelhochdeutsche Grammatik;* Bachmann's *Mittelhochdeutsches Lesebuch;* Hartmann von Aue's *Der Arme Heinrich.* Elective. Professor FEHR.

First, second and third terms. Two hours per week.

110. TEACHER'S COURSE.—Preparation: 89. A critical study of the methods of teaching foreign languages. Lectures, reports and practice. Selection and criticism of text-books. Discussion on sight-reading, composition and phonetics. Elective. Professor FEHR.

Third term. Two hours per week.

FRENCH.

Courses 111, 112 are prescribed for technical students who have entered on German.

111–112–113. ELEMENTARY FRENCH.—Elective for all technical Freshmen entering on German, except those in the Chemical Course. Principles of grammar and syntax; prose composition in connection with reading of easy narrative prose. Scientific and technical French will be included in the second and third terms. First, second and third terms, Freshman year. Four periods per week.

114. ELEMENTARY FRENCH.—Prescribed for Sophomores in the Classical Course and those in the General Scientific and Latin Scientific Courses, offering German for entrance. Grammar, composition, sight-reading and translation of easy prose; careful drill in pronunciation. First term, Sophomore year. Two periods per week.

115. ELEMENTARY FRENCH.—Continuation of 114. Thorough study of irregular verbs, grammar composition, translation and sight-reading. Second term, Sophomore year. Two periods per week.

116. INTERMEDIATE FRENCH.—Continuation of 115. Translation and sight-reading from *Guerlac's Standard French Authors* or similar books; discussion of various works of the authors represented; prose composition. Third term, Sophomore year. Two periods per week.

121–122–123. ADVANCED FRENCH.—Preparation: Entrance French B. Prescribed for Freshmen in the Latin Scientific and General Scientific courses and elective for those in the engineering courses. Review of grammar; reading of standard authors; prose composition. First, second and third terms, Freshmen year. Two periods per week.

127–128–129. ADVANCED FRENCH.—Prescribed for those Sophomores in the General Scientific and Latin Scientific Courses who were scheduled in Freshman year for 121–122–123. Modern plays. Newspaper French. Composition. First, second and third terms, Sophomore year. Two periods per week.

131. FRENCH HISTORY.—Reading of selections from various historians. Discussions. First term, Junior year. Two periods per week.

132. MODERN FRENCH NOVEL.—Selections from Dumas *père*, Hugo, George Sand, Zola, etc. Lectures. Second term, Junior year. Two periods per week.

133. LITERATURE OF THE SEVENTEENTH CENTURY.—Collateral reading in History of French literature. Delpit's *L'Age d'Or de la Littérature Française.* Third term, Junior year. Two periods per week.

134–135–136. ADVANCED FRENCH.—Open to those who have completed Courses 127–128–129. Modern prose. Modern plays. Conversation based on Kron's *French Daily Life.* First, second and third terms, Junior year. Two periods per week.

137. FRENCH TRAGEDY.—Study of the tragedy from Corneille to Rostand. Lectures. First term, Senior year. Two periods per week.

138. FRENCH COMEDY.—Molière to Dumas *fils.* Lectures. Second term, Senior year. Two periods per week.

139. FRENCH.—The Romantic Drama. Hugo's *Hernani* or *Ruy Blas.* Lectures. Third term, Senior year. Two periods per week.

140. FRENCH LITERATURE OF THE SIXTEENTH CENTURY.—Selections from Ronsard, Marguerite de Valois, Marot, Jodelle, etc. The Pléiade. Alternates with 133. Third term, Senior year. Two periods per week.

141–142. HISTORICAL FRENCH GRAMMAR.—Development of French from Latin. Alternates with 138, 139. Second and third terms, Senior year. Two periods per week.

143–144–145. ADVANCED FRENCH.—Open to those who have completed 134–135–136. French for Teachers. Advanced composition. French Commercial Correspondence. First, second and third terms, Senior year. Two periods per week.

SPANISH.

141. ELEMENTARY COURSE.—Pronunciation, inflection, the laws of syntax and their application. Translation of simple prose; oral exercises and composition. First term, Junior year. Two periods per week.

142. ELEMENTARY COURSE.—(Continued.)—Grammar, reading, composition, conversation. Second term, Junior year. Two periods per week.

143. MODERN PROSE.—Translation and sight reading from the works of such authors as Alarcón, Becquer, Valera, Galdés. Continued composition and oral drill. Third term, Junior year. Two periods per week.

144. MODERN PLAYS.—Reading of plays of Echegaray, Gil y Zarate, Moratín. Composition. First term, Senior year. Two periods per week.

145. THE NOVEL OF THE SIXTEENTH AND SEVENTEENTH CENTURIES.—Selections from *Don Quixote*. History of the period. Second term, Senior year. Two periods per week.

146. AMERICAN SPANISH LITERATURE.—Poems in *Bardos Cubanos*. Spanish Correspondence. Third term, Senior year. Two periods per week.

ITALIAN.

151. ELEMENTARY COURSE.—Principles of grammar, pronunciation, inflection, simple prose translation, oral exercises and composition. First term, Junior year. Two periods per week.

152. ELEMENTARY COURSE.—(Continued.)—Further grammar, composition and oral work; Bowen's *Italian Reader*. Second term, Junior year. Two periods per week.

153. MODERN NOVEL.—Translation and sight reading from Manzoni's *I Promessi Sposi* and works of similar grade. Composition continued. Third term, Junior year. Two periods per week.

154. ITALIAN OF DANTE.—Reading of selected canti of the *Divina Commedia*. A study of Dante and his place in Florentine history. First term, Senior year. Two periods per week.

155. BOCCACCIO.—Selections from Fornaciari's edition of the *Decamerone* will be read. Discussions concerning the origin of some of the tales. Second term, Senior year. Two periods per week.

156. PETRARCH.—Translation from the edition of Carducci and Ferrari. Study of the sonnet, madrigal, *canzone*, etc. Third term, Senior year. Two periods per week.

THE GREEK LANGUAGE AND LITERATURE.

Professors Youngman (Professor Emeritus) and Rankin and Mr. Cram

The aim in the Greek courses leading to the A.B. degree is to secure a mastery of the language, for which an exact knowledge of forms of words and of the essential principles of syntax is indispensable. Particular attention is paid to the study of Greek Prose during the first term of Freshman year. A correct understanding of the significance of words is also sought through the study of their inherent root meanings, while Greek idioms and forms of expression are learned by way of contrast with those of the Latin and English languages.

But the chief end in view is to acquire an appreciation of Greek literature and, through this medium, of the Greeks themselves. The History of Greek literature is learned through association of authors with contemporaneous historical events. The political history and institutions of the Greeks, their daily life, their customs and their religious beliefs are studied hand in hand with their language and literature. The student is encouraged to read largely in the representative authors selected for study in the class room. Themes on subjects drawn from various phases of Greek life are required in connection with the regular work. In this way the close relationship of the Greek of Classical times and the man of today is more perfectly realized.

In the required work of the first two years the prose writers are represented in the reading of the early Attic orators, of Herodotus, of Xenophon, and of Plato. In poetry large parts of both Iliad and Odyssey are read, and the student is introduced to the Greek drama in plays of Sophocles, Euripides and Aristophanes.

In the elective Greek, for the present courses are offered to qualified Juniors and Seniors, four hours a week, throughout the year.

For 1915–1916 the courses offered will comprise the study of selected plays of Aristophanes and Menander, representing the Old and the New Comedy, of Thucydides (books VI and VII) and of the Lyric poets and Theocritus. The reading of these authors will be accompanied by parallel reading in the origin and development of Greek comedy and in the history of the Peloponnesian war, in the history of the period of the Sicilian Expedition, and by a review of the early and Alexandrian periods of Greek literature. During 1916–1917, courses will be offered in Demosthenes and Aeschines on the Crown and in selected plays of Sophocles and Aeschylus.

For 1915–1916 an additional course in the reading and interpretation of Plato's Republic, two hours a week throughout the year, will also be offered to qualified Juniors and Seniors.

Other courses will be offered, by way of substitution, from time to time in Lucian, in Aristotle's Poetics and Constitution of Athens and in Plato's Protagoras.

Following is a synopsis of the courses offered:

161. LYSIAS, the oration against Eratosthenes and some of the shorter orations (Adams). Plato, *The Apology*, and Xenophon, selections from the *Memorabilia* (Dyer and Seymour). Greek Prose Composition (Spieker). First term, Freshman year. Four periods per week.

162. HERODOTUS, books VII and VIII (Smith and Laird). "A History of Greece," Bury, to Chapter XI (the Peace of Nicias,

421 B. C.) Second term, Freshman year. Four periods per week.

163. Homer, *The Iliad*, books XIX–XXIV (Clapp). "A History of Greece," Bury, from the Peace of Nicias to the death of Alexander the Great, 323 B. C. Third term, Freshman year. Four periods per week.

164. HOMER, *The Odyssey*, books I–XII (Merry). "Life of the Ancient Greeks," Gulick. Themes on Greek life. First term, Sophomore year. Four periods per week.

165. "SELECTIONS FROM THE ATTIC ORATORS" (Jebb). "Greek Literature," Wright. Themes based on the study of the Greek orators. Second term, Sophomore year. Four periods per week.

166. INTRODUCTION TO THE GREEK DRAMA. Sophocles, *Antigone* (Bayfield); Aristophanes, *The Clouds* (Merry). "Greek Literature," Wright. Themes on the history of the Greek Drama and on scenic antiquities. Third term, Sophomore year. Four periods per week.

167. DEMOSTHENES, *On the Crown* (Humphreys), and Aeschines, *Against Ctesiphon* (Richardson). Review of the period of Philip and Alexander. Greek Constitutional Antiquities. Elective. First term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1916–1917.)

168. GREEK TRAGEDY. Sophocles, *Oedipus the King* (Jebb), *Oedipus at Colonus* (Jebb and Schuckburgh), and *Electra* (Jebb and Davies). Parallel reading in works on the Greek Drama. Elective. Second term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1916–1917.)

169. GREEK TRAGEDY. Aeschylus, *Prometheus Bound* (Prickard), *Seven against Thebes* (Sidgwick), *Eumenides* (Sidgwick). Parallel reading. Elective. Third term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1916–1917.)

170. GREEK COMEDY. Aristophanes, *Birds*, *Frogs*, and *Acharnians* (Merry). Menander, fragmentary plays (Capps).

Lectures on the history of Greek Comedy. Elective. First term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1915–1916.)

171. THUCYDIDES, books VI and VII (Lamberton). Review of the period of the Sicilian Expedition. Elective. Second term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1915–1916.)

172. LYRIC POETS, selections (Tyler). Theocritus (Cholmeley). Elective. Third term course, open to qualified Juniors and Seniors. Four periods per week. (To be given in 1915–1916.)

172(*a*). Plato, the Republic (Adam). Reading and interpretation of the dialogue, together with the study of its influence upon later literature. Open to qualified Juniors and Seniors. Two periods per week, through the entire year. (To be given in 1915–1916.)

For students who do not offer Greek for entrance the following courses are available and may be substituted, throughout the year, for certain other courses in the College curriculum. (See pages 39 and 48.)

173. BEGINNER'S GREEK BOOK (Benner and Smythe). Xenophon, *Anabasis*, books I and II (Murray). Greek Prose Composition (Pearson). Freshman year, four periods per week, through the entire year.

174. XENOPHON, *Anabasis*, books II–IV (Murray). Homer, *The Iliad*, books I–III and selections (Sterrett). Greek Prose Composition (Pearson). Themes. Sophomore year, four periods per week, through the entire year.

For students who begin the study of Greek in College and successfully complete the courses of the first two years the following courses are offered in satisfaction of the requirements for the A.B. degree:

175. Homer, *The Odyssey*, selections from books I–XII (Merry). Herodotus, selections (Merry). "A History of Greece," Bury,

to chapter X (the beginning of the Peloponnesian War, 431 B. C.) First term, Junior year. Four periods per week.

176. Thucydides, books VI and VII (Lamberton). "A History of Greece," Bury, to chapter XV (the death of Epaminondas, 362 B. C.) Second term, Junior year. Four periods per week.

177. Plato. *The Apology* and *Crito*, with selections from the *Phaedo* and *Symposium* and from Xenophon's *Memorabilia* (Dyer and Seymour). "A History of Greece," Bury, from the death of Epaminondas to the death of Alexander the Great, 323 B. C. Third term, Junior year. Four periods per week.

178. "Selections from the Attic Orators" (Jebb). "Life of the Ancient Greeks" (Gulick). First term, Senior year. Four periods per week.

179. Euripides, *Iphigenia among the Taurians* (Jerram). Sophocles, *Antigone* (Bayfield). "Greek Literature," Wright. Second term, Senior year. Four periods per week.

180. Aeschylus, *Prometheus Bound* (Prickard). Aristophanes, *The Frogs* (Merry). "Greek Literature," Wright. Third term, Senior year. Four periods per week.

THE LATIN LANGUAGE AND LITERATURE.

Professor Owen and Messrs. Lacey, McDonald and Aston.

It is the aim of this Department to give the students an intelligent acquaintance with the language, literature and institutions of Rome, and qualify them for the efficient treatment of these subjects as teachers, or for the further scholarly pursuit of these and kindred studies after graduation if they should be so disposed. An effort is made to unite accuracy in details with facility in reading within the limits of a reasonable range.

It is kept in mind, also, that the training in this Department should be practically helpful and valuable to those who are to speak and write the English language.

With a view to cultivate the power of expression, besides the oral work of the class room, there are frequent exercises in writing, in which it is sought to faithfully render the author into the English of our literary standards.

181. LIVY.—Books XXI–XXII, with Roman History and Latin Prose. First term, Freshman year. Four periods per week.

182. HORACE.—Odes and Epodes. Latin Prose. Second term, Freshman year. Four periods per week.

183. HORACE.—Satires and Letters with Roman Antiquities. Third term, Freshman year. Four periods per week.

184. CICERO.—DeOratore with history of the last Century of the Roman Republic. First term, Sophomore year. Four periods per week.

185. LATIN HYMNS.—Latin Hymns with Early Roman Literature. Second term, Sophomore year. Four periods per week.

186. CICERO.—De Officiis. Third term, Sophomore year. Two periods per week.

187. TACITUS.—Agricola and Germania. Roman Literature of the Silver age. First term, Junior year. Two periods per week.

188. JUVENAL.—Roman Archaeology, illustrated by an Extensive Collection of Roman photographs. Second term, Junior year. Two periods per week.

189. TACITUS.—Annals. Third term, Junior year. Two periods per week.

190. TERENCE OR PLAUTUS.—First term, Senior year. Two periods per week.

191. EPISTOLARY LATIN. Pliny and Cicero. Second term. Senior year. Two periods per week.

192. LUCRETIUS.—Third term, Senior year. Two periods per week.

THE HEBREW LANGUAGE.

201. ELEMENTARY HEBREW.—Etymological principles of Hebrew; inflections and laws of euphonic changes. Elective. Second term, Senior year. Two periods per week.

202. HEBREW (Continued).—Translation of portions of Old Testament History from Hebrew into English, and from English into Hebrew. Elective. Third term, Senior year. Two periods per week.

THE BIBLE.

Professors Owen, Roberts, Lyle, Rankin, Martin, Fehr, Hopkins, Marquard and Messrs. Hatch, Cawley, Snyder, Knowlton, Schwarz, Klaessig, Aston, Spotts, Cram and Bierstadt.

In the Freshman year a general survey of the Bible will be made with the purpose of impressing upon the students the character of its contents, the various books and their relation to the whole, and familiarizing them with its actual language and ideas. So far as may be profitable for this dominant purpose, instruction will be given in Bible history and geography, but the great object is to make the student familiar with the very words of the English Bible.

The Sophomore year is devoted to a detailed study of one of the synoptic gospels. Those who study Greek use the Greek Testament; those taking the Latin Scientific course, a Latin version.

The Acts of the Apostles is studied in the Junior year by all except the Latin Scientific Juniors, who pursue a general course upon the plan of Redemption. Special attention is given to the lives and labors of the Apostles and the founding of the Christian Church.

The Senior year is devoted to a general survey of Church History. In the first and second terms the History of the Church in Europe is given. This is followed in the third term with a course in American Church History.

221–22–23. THE BIBLE.—General survey of the Old Testament and the Life of Christ. Required of all students throughout the Freshman year. One period per week.

224–25–26. THE NEW TESTAMENT.—The Gospels. Required of Technical students throughout the Sophomore year. One period per week.

227–28–29. THE NEW TESTAMENT.—The Gospels, in Greek. Required of Classical students throughout the Sophomore year. One period per week.

230–31–32. THE NEW TESTAMENT.—The Gospels, in Latin. Required of Latin Scientific students throughout the Sophomore year. One period per week.

233–34–35. THE NEW TESTAMENT.—The Acts of the Apostles. Required of Technical and General Scientific students throughout the Junior year. One period per week.

236–37–38. THE NEW TESTAMENT.—The Acts of the Apostles in the Greek. Required of Classical students, throughout the Junior year. One period per week.

239–40–41. THE PLAN OF REDEMPTION.—Required of Latin Scientific students throughout the Junior year. One period per week.

242–43. CHURCH HISTORY.—Uhlhorn's Conflict of Christianity with Heathenism. Required of all Classical Latin and General Scientific Seniors. Practical Ethics. Required of all Technical Seniors. Second and third terms, Senior year. One hour per week.

244. HISTORY OF THE ENGLISH BIBLE.—Required of all Seniors. First term, Senior year. One period per week.

MARTIEN, FAYERWEATHER AND POWELL HALLS.

PHILOSOPHY.

Professor Martin.

The required courses in Philosophy are Psychology, Logic, Ethics, Theism. These are presented as a continuous course, beginning with the second term of the Junior year, and extending to the end of the Senior year. In addition to these required courses, elective courses are offered in the principles of Philosophy, and in the History of Philosophy. These courses cover the Senior year and are given two periods a week.

PEDAGOGY.—In connection with the courses in Philosophy provision is made for an adequate course in Pedagogical subjects.

In addition to the required psychology of the regular course two hours a week throughout the Junior or Senior year may be given to the History of Education, and Educational Psychology. The courses in Pedagogy are supplemented by lectures from distinguished educators actively engaged in public school work.

The course as presented amply covers the requirements of the Pennsylvania School Code for State Certificate.

251. LOGIC.—In connection with Psychology during the third term, Junior year. Lectures and exercises.

252. PSYCHOLOGY.—Three periods per week during the second and third terms of Junior year. Text book James' *Briefer Course.*

254. PHILOSOPHY.—Two periods per week during the first term of Senior year.

281. ETHICS.—Three periods per week during the first term, Senior year. Text books. McKenzie, Paulsen, with lectures and discussion.

291. HISTORY OF PHILOSOPHY.—Two periods per week during second and third terms, Senior year.

301. HISTORY OF EDUCATION.—Two periods per week during first and second terms—open to Seniors and Juniors.

302. THEISM.—Two periods per week during the second term, Senior year. Textbook. Flint's *Theism*.

303. EDUCATIONAL PSYCHOLOGY.—Two periods per week during third term. Open to Seniors and Juniors.

LECTURES ON EDUCATION.—In view of the increased requirements for teachers embodied in this state, an effort has been made to extend the courses in education given in connection with the department of philosophy and to supplement these by others bearing more directly upon the practical side of the teacher's work.

HISTORY, POLITICAL AND SOCIAL SCIENCE.

Professors Owen, Roberts and Rankin, and Messrs. Kirkpatrick, Spotts, McDonald, Aston and Cram.

The work of this department is designed to give such a general knowledge of History and Political Science as belongs to a liberal education. At the same time sufficient work is offered in the electives to well equip for their future work and study students who desire to take up graduate work or to engage in the practice of law or the public service or teaching. The instruction is given by text-books, by lectures, and by library references, the students reporting the results of their reading partly during the regular work of the class, and partly in the forms of essays. The subjects covered by the course are in detail as follows:

311. ANCIENT HISTORY.—Survey of the history of Greece and Rome in connection with the courses in Latin and Greek. Political, social, literary and philosophical history of each epoch. Classical Geography.

312–14. Mediaeval and Modern European History.—These courses are treated as a continuous year's course in European History from 378 to 1913. First, second and third terms, Freshman year. Two periods per week.

321–23. AMERICAN HISTORY.—These courses are treated as a continuous year's course in American History from 1492 to 1913. (*a*) Course **321**, from 1492 to 1750, is a study of the discovery, exploration, and settlement of the continent, and the growth and development of colonial institutions. (*b*) Course **322**, from 1750 to the downfall of the Federalist Party, treats of the growth of united action among the colonies, the establishment of the Federal Government, and the development of nationality. (*c*) Course **323**, from the downfall of the Federalist Party to the present time, is an account of the development and expansion of the United States. First, second and third terms, Sophomore year. Two periods per week.

324. AMERICAN HISTORY FROM 1600 TO 1873.—An advanced study intended to trace the beginnings of our nation rather than the details of the history of the individual colonies. Emphasis is laid on the European inheritance brought to this country by the colonists, their social and political life, the expansion of population, the struggle between France and England, the causes of the Revolution, and the growth of union and independence. Elective. Second term, Junior year. Two periods per week.

331. HISTORY OF ENGLAND FROM THE NORMAN CONQUEST TO THE ACCESSION OF THE TUDOR DYNASTY.—The narrative history of England is made the basis of study, but especial attention is given to the economic, social and intellectual life of the people, and the development of English institutions. First term, Junior year. Two periods per week.

332. HISTORY OF ENGLAND FROM THE ACCESSION OF THE TUDOR DYNASTY TO 1688. Elective. Second term, Junior year. Two periods per week.

341. CONSTITUTIONAL HISTORY.—The United States. This is a required course in the Constitution of the Unites States. Fiske's Critical Period of American History is used as an introduction, and is followed by a critical study of the Constitution section by section with especial reference to its historical development and its subsequent interpretation and construction. Third term, Junior year. Two periods per week.

345–46. CONSTITUTIONAL HISTORY.—The United States (Continued). Preparation: **341.** Detailed study of the subject, with Bryce's American Commonwealth as an introduction and general guide. Lectures, discussions and written reports on questions of American citizenship. Elective. Second and third terms, Senior year. Two periods per week.

351–53. POLITICAL SCIENCE AND COMPARATIVE GOVERNMENT.—(*a*) An introduction to political science, including a study of the origin of the state, and of the special significance of the terms state, government law, rights, and sovereignty. (*b*) A comparative study of the governmental systems of England, France, Germany and Switzerland. Constitutional and political changes in other countries are considered briefly. The course deals principally with the constitutions, organizations of departments, political parties, and administrative practices. Elective. First, second, and third terms, Senior year. Two periods per week.

361–62. LAW.—Elective courses in Blackstone's Commentaries. Second and third terms, Senior year. Two periods per week.

363–64. BUSINESS LAW.—A study of the elementary principles of contracts, agency, partnerships, corporations, sales, insurance, estates, and negotiable paper. The aim of the course is to give a knowledge of the law which will be of service in the affairs of every day life. Elective. Second and third terms, Senior year. Two periods per week.

365. International Law.—The course in International Law undertakes to do little more than to exhibit the fundamental principles which govern international affairs, and by the study of a few important cases to show the method of diplomatic procedure. It is especially intended to give the students the information needed to understand current discussions of foreign relations. Text-book—Hershey's Essentials of International Public Law. Elective. First term, Senior year. Two periods per week.

371. Economics.—An introduction to the elementary principles of Economics. Required. Second term, Senior year. Two periods per week.

372. Economics.—A continuation of Course 371. The application of economic principles to concrete problems—international trade, money, currency and banking, capital and labor, transportation, state control of business activities and socialism—as these may be questions of contemporary interest. Required. Third term, Senior year. Two periods per week.

MATHEMATICS.

Professors Hardy, Hall and Marquard, and Messrs. Hatch, Cawley, Synder, Bray and Spotts.

It is strongly recommended that algebra be thoroughly reviewed just before admission to college.

401. Algebra.—Binominal theorem, theory of logarithms, probability, variables and limits, series and theory of equations. Text-book—Wentworth's College Algebra. First term, Freshman year, two periods per week. Second term, Freshman year. Three periods per week.

402. Algebra.—Preparation: Entrance Mathematics B. Through Ratio, Proportion and Variation. First term, Freshman year. Two periods per week.

403. Algebra Completed.—Preparation: 402. (Continuation of 402.) Second term, Freshman year. Four periods per week.

404. ALGEBRA.—To Progressions. Second term, Freshman year. Four periods per week.

405. ALGEBRA COMPLETED.—(Continuation of **404.**) Third term, Freshman year. Four periods per week.

406. GEOMETRY.—Solid Geometry. First term, Freshman year. Two periods per week.

407. GEOMETRY.—Solid Geometry. First term, Freshman year. Four periods per week.

411. TRIGONOMETRY.—The work in this course begins with a rapid review of the elementary Plane Trigonometry. Then follows the advanced Plane Trigonometry, consisting of derivation of formulas and trigonometrical series, solution of right- and oblique-angled triangles and solution of problems involving the practical applications. About one-third of the term is devoted to Solid Trigonometry which is also completed. Text-book—Hall and Funk's Trigonometry. First Term, Freshman year. Two periods per week. Second term, Freshman year. Two periods per week.

412. TRIGONOMETRY.—Preparation: **403**, **406.** Third term, Freshman year. Four periods per week.

413. TRIGONOMETRY.—Preparation: **405, 406.** First term, Sophomore year. Four periods per week.

416. ANALYTICAL GEOMETRY.—The work in this subject consists of the Analytical Geometry of two dimensions, including the point, right line and circle; the conics, tangents, diameters, transformation of coördinates, the general equation of the second degree and higher plane curves; also the Analytical Geometry of three dimensions, including the point, the plane and surfaces of revolution. Text-book—Ashton's Analytic Geometry. Third term, Freshman year. Four periods per week.

417. ANALYTICAL GEOMETRY (Continued).—First term, Sophomore year. Two periods per week.

418. ANALYTICAL GEOMETRY.—Preparation: **412.** Drawing of curves from their equations; accurate demonstrations of propositions. First term, Sophomore year. Four periods per week.

419. ANALYTICAL GEOMETRY.—Preparation: **418.** (Continuation of **418.**) Four periods per week. Second term, Sophomore year. Four periods per week.

420. ANALYTICAL GEOMETRY.—Preparation: **413.** Same as **418.** Second term, Sophomore year. Four periods per week.

421. MENSURATION.—The work includes the mensuration of the ordinary geometrical magnitudes, conic sections and curved surfaces and solids. The prismoidal formula, Simpson's rule, etc., are given. Text-book—Hall's Mensuration. Third term, Freshman year. One period per week.

426. DIFFERENTIAL AND INTEGRAL CALCULUS.—The work in the Differential Calculus consists of the differentiation of all the functions of one or more variables, successive differentiation, implicit functions, development of function, evaluation of indeterminate forms, maxima and minima, properties of curves and radius of curvature, together with numerous practical applications in Mechanics. In the Integral Calculus are treated the integration of rational, irrational and transcendental functions, integration by parts and successive integration, rectification of curves, quadrature of plane surfaces, surfaces and volumes of solids, centers of gravity of lines, surfaces, and solids, and moments of inertia. Text-book—Hall's Differential and Integral Calculus. First term, Sophomore year. Three periods per week.

427. DIFFERENTIAL AND INTEGRAL CALCULUS (Continued).—Second term, Sophomore year. Five periods per week.

429. DIFFERENTIAL CALCULUS.—Preparation: **419–420.** Elective. First term, Junior year. Four periods per week.

430. INTEGRAL CALCULUS.—Preparation: **429.** Elective. Second term, Junior year. Four periods per week.

431. CALCULUS.—Preparation: **430.** Application of the Calculus to the study of Loci. Elective. Third term, Junior year. Four periods per week.

432. DIFFERENTIAL EQUATIONS.—Preparation: **431.** Elective. First term, Senior year. Two periods per week.

433–44. THEORY OF FUNCTIONS.—Preparation· **432.** Elective. Second and third terms, Senior year. Two periods per week.

436. LEAST SQUARES.—Law of probability of error, adjustment of observations, precision of observations and empirical formulas. The problems are selected with particular attention to the needs of engineers. Text-book—Merriman's Least Squares. Third term, Sophomore year. Two periods per week, for half term.

437. DIFFERENTIAL EQUATIONS.—In this subject are given the principal differential equations of the first order and degree, and those of the second order that are of importance in the applied mathematics that follow. Text-books—Hall's Differential and Integral Calculus. Third term, Sophomore year. Two periods per week.

TECHNICAL DRAWING AND DESCRIPTIVE GEOMETRY.

Professor Graves and Mr. Slantz.

441*a*. DRAWING.—Use of drawing instruments and materials; elementary plates of such a nature as to give the student practice in using drawing instruments and knowledge concerning the simpler operations of drawing; free-hand pen shading; conic sections. Text-book, "Mechanical Drawing"—Graves. First term, Freshman year. Two 2-hour exercises per week.

441*b*. DRAWING.—Plates concerning the projection, revolution, and successive revolution of geometric solids in connection with Course 443*a*. Orthographic Projection; working drawings of machine details, and fastenings such as bolts, nuts and screw threads. Text-book, "Mechanical Drawing"—Graves. Second term, Freshman year. Two 2-hour exercises per week.

441*c*. DRAWING.—Drawings of large structures taken from detail sketches and uncompleted views—such as bent for a timber trestle, squared timber highway bridges, built up steel columns and girders; plates in connection with Course 443*b*, Orthographic Projection, tracing and blue-printing. Text-book, "Mechanical Drawing"—Graves. Third term, Freshman year. Two 2-hour exercises per week.

442. LETTERING.—Analytical study of, and practice in, making lower case and capital letters suitable for general engineering drawing; the lettering of connected sentences to acquire facility in spacing; lettering suitable for titles. Text-book, "Freehand Lettering"—Reinhardt. First term, Freshman year. Two 1-hour exercises per week.

443*a*. ORTHOGRAPHIC PROJECTION.—Training the technical imagination and power of visualization in three dimensions through the projection, revolution, and successive revolution of geometric solids; direct application of the principles involved to mechanical drawing. Text-book, "Mechanical Drawing"—Graves. Second term, Freshman year. Two 1-hour recitations per week.

443*b*. ORTHOGRAPHIC PROJECTION.—A consideration of points and lines in their relations to one another and to the three planes of projection, in order to further develop the relationship of orthographic projection to the graphic language of mechanical drawing, and at the same time to lay a firm foundation for the subsequent study of Descriptive Geometry. Text-book, "Orthographic Projection"—Graves. Third term, Freshman year. Two 1-hour recitations per week.

451*a*. DESCRIPTIVE GEOMETRY.—Problems on the point, line and plane. Particular emphasis is laid on the necessity to mentally visualize the problem under discussion. Text-book, "Descriptive Geometry"—Hall. First term, Sophomore year. Two 1-hour recitation and 1 hour of drawing per week.

451*b*. DESCRIPTIVE GEOMETRY.—Generation and properties of surfaces of single and double curvature; intersections and developments of planes with solids and solids with solids; warped surfaces; tangent planes. Text-book, "Descriptive Geometry"—Hall. Lectures. Second term. Sophomore year. Two 1-hour recitations and 1 hour of drawing per week.

451*c*. Descriptive Geometry.—The applications of the principles of Descriptive Geometry to isometric drawing; shades and shadows; the shadows of isometric drawings; perspective drawing and shadows. Lectures, recitations, and drawings. Third term, Sophomore year. Two recitations and 1 hour of drawing per week.

452. Machine Drawing.—Neat, free-hand sketches of actual pieces of machinery such as pulleys, gears, shaft hangers, pistons, valves, eccentrics, etc. From these sketches, drawings and tracings are made; class room work on the elements of machine design. Third term, Sophomore year. Two 2-hour exercises per week.

PHYSICS.

Professor Gordon and Messrs. Lockwood, Balderston and Eichlin.

Physics is required of all candidates for a degree, four periods per week for one year.

Two additional periods per week are required of students in the Electrical Engineering course during the Sophomore year.

Students in the general courses may take elective work in the subject in third term of Junior year and throughout the Senior year.

Courses 461–463 constitute the required work of those in Classical, Latin Scientific and General Scientific courses.

461. Light and Sound.—Two lectures, two recitations and two 2-hour laboratory periods per week. Third term, Sophomore year.

462. Mechanics and Heat. Two lectures, two recitations and two 2-hour laboratory periods per week. First term, Junior year.

463. ELECTRICITY AND MAGNETISM. Two lectures, two recitations and two 2-hour laboratory periods per week. Second term, Junior year.

Courses 464–471 are elective. A two-hour lecture and recitation course and a laboratory course requiring two 2-hour periods per week are given each term. Students expecting to teach Physics should take all these courses, but either one or both may be elected any term.

464. APPLIED ELECTRICITY.—Dynamos, motors, electric lighting, wireless telegraphy, induction coils, etc. Two recitations per week. Third term, Junior year.

465. ELECTRICAL MEASUREMENTS.—Inductance and capacity, efficiency of dynamos and motors, photometry, etc. Two 2-hour laboratory periods per week. Third term, Junior year.

466. THEORY OF IONS AND ELECTRONS.—The dissociation theory of electrolytes, galvanic cells, conductivity of gases and radioactivity. Lectures and recitations. Two hours per week. First term, Senior year.

467. ELECTRICAL MEASUREMENTS.—Conductivity of electrolytes, E.M.F. of cells, currents through gases and radioactive measurements. Two 2-hour laboratory periods per week. First term, Senior year.

468. PHYSICAL OPTICS.—Interference, dispersion and radiation theories, with applications to optical instruments. Lectures and recitations. Two hours per week. Second term, Senior year.

469. OPTICAL MEASUREMENTS.—The spectrometer, gratings, interferometers, polarimeters, and pyrometers. Two 2-hour laboratory periods per week. Second term, Senior year.

470. MOLECULAR PHYSICS AND HEAT.—Physics of the atoms and molecules. Lectures and recitations. Two hours per week. Third term, Senior year.

471. MOLECULAR MEASUREMENTS.—Measurements in heat, determinations of molecular weights, velocities of reactions, etc.

Two 2-hour laboratory periods per week. Third term, Senior year.

Courses **472–474** are required of all technical and chemical students during their Sophomore year.

472. ELEMENTARY MECHANICS.—Two lectures, two recitations and two 2-hour laboratory periods per week. First term, Sophomore year.

473. HEAT, ELECTRICITY AND MAGNETISM.—Two lectures, two recitations and two 2-hour laboratory periods per week. Second term, Sophomore year.

474. ELECTRICITY, MAGNETISM, SOUND AND LIGHT. Two lectures, two recitations and two 2-hour laboratory periods per week. Third term, Sophomore year.

Courses **475–477** are required of Electrical Engineering students.

475. ELECTRICAL MEASUREMENTS.—Elementary electrical measurements. Two periods per week. First term, Sophomore year.

476. ELECTRICAL MEASUREMENTS.—Bridge tests, inductance, capacity, the potentiometer and photometry. Two periods per week. Second term, Sophomore year.

477. DIRECT CURRENT ENGINEERING.—D. C. dynamos and motors, switches and circuit breakers, wiring, etc. Two recitations per week. Third term, Sophomore year.

MINERALOGY AND GEOLOGY.

Professor Peck and Mr. Fretz.

The course in Geology is continuous and each term's work depends upon that which has preceded. It is desirable that students electing this subject should do so for at least two terms and that they should be familiar with the elements of Physics, Chemistry and Biology. For the work of the Senior year, a knowledge of these subjects is required.

491. DYNAMICAL, STRUCTURAL AND PHYSIOGRAPHICAL GEOLOGY.—Text-book and illustrated lectures. Elective. First term. Junior year. Two periods per week.

492. HISTORICAL GEOLOGY.—Preparation: **491.** Stratigraphic sequence of rocks, and fossil forms. Elective. Second term, Junior year. Two periods per week.

493. CRYSTALLOGRAPHY.—Preparation: **492.** Crystal forms, properties of crystalline substances, drawing and measurements of crystals. Elective. Third term, Junior year. Two periods per week.

494. PRACTICAL FIELD GEOLOGY.—Preparation: **493.** Elective. First term, Senior year. Two periods per week.

495. ADVANCED CRYSTALLOGRAPHY AND ELEMENTARY PETROGRAPHY.—Preparation: **494.** Elective. Second term, Senior year. Two periods per week.

496. FIELD GEOLOGY.—Preparation: **495.** Elective. Third term, Senior year. Two periods per week.

511. CRYSTALLOGRAPHY.—This course is illustrated with glass and wooden models, and each alternate exercise consists of a practicum at which well-crystallized minerals are studied, and their properties discussed. The latter part of the term is devoted to a brief discussion of the optics of crystals. Text-book—Williams' Elements of Crystallography. First term. Junior year. Two periods per week.

512. PETROGRAPHY.—A large collection of hand specimens of rocks with thin sections is used in this study. Text-book—Kemp's Handbook of Rocks and Frulay's Igneous Rocks. Second term, Junior year. Two periods per week. Third term, Senior year. Two periods per week.

513. MINERALOGY.—A systematic review of mineral species, more special attention being paid to their chemical and crystallographic relations and to their mode of occurrence in nature. Instruction is given by lectures which are illustrated by a study collection consisting of some two thousand specimens, including the most important species. A course in determinative mineralogy supplements these lectures. The student is required to determine sixty minerals and to write out a description of each. Third term, Junior year. Three periods per week.

516. General Geology.—Dynamical, Structural and Physiographical Geology. The work of the class-room is supplemented by excursions into the neighboring region, and sufficient time is devoted to field work to enable each student to construct a ten-mile section up and down the Delaware River at Easton. Text-book—Scott's Introduction of Geology. First term, Senior year. Two periods per week.

517. General Geology.—Continuation of Course **516.** Historical Geology. Accumulations, organic and inorganic, which are of economic importance. Text-book—Scott's Introduction to Geology. Second term, Senior year. Two periods per week.

521. Mining Geology. Economic Geology.—Practical geology of the metalliferous deposits. This is a lecture course, but reading is assigned in the following works: "Economic Geology of the United States," Ries; "Ore Deposits of the United States and Canada," Kemp; "The Nature of Ore Deposits," Beck; etc. Second term, Senior year. Two periods per week.

522. Mining Geology. Field Geology.—In this course the student makes a detailed study of an area, from which he constructs a colored geological map and geological sections. Specimens of the different rocks and ores are collected and thin sections are cut for microscopical examination. Third term, Senior year. Two periods per week.

523. Mining Geology.—Elective. First term, Senior year. Two periods per week.

524. Mining Geology.—Elective. Second term, Senior year. Two periods per week.

ASTRONOMY.

Professors Coffin (Professor Emeritus) and Hardy, and Mr. Cawley.

531. Descriptive Astronomy.—Fundamental definitions of the celestial sphere, parallax, refraction, the earth as an astronomical body, the sun, the moon eclipses and the planets. Text-book—Young's Astronomy. First term, Senior year. Two periods per week.

536. DESCRIPTIVE ASTRONOMY.—More detailed course than **53**. First term, Senior year. Four periods per week.

541-42. PRACTICAL ASTRONOMY.—The use of the sextant in determining time by a single altitude of the sun, by a single altitude of a star, by equal altitudes of the sun, by equal altitudes of a star; in determining latitude by the meridian altitude of a star in any position and by circummeridian altitudes. The instrument constants of the transit instrument and its use in determining longitude. The use of the zenith telescope in determining latitude. The sections of the class are made so small that each student gets considerable practice with the instruments. Second and third terms, Senior year. Two periods per week.

543. ASTRONOMY FOR ENGINEERS.—The work includes a brief introductory course in general Astronomy. This is followed by direct observations on the sun and polaris to determine latitude and azimuth. Azimuth is also found by means of the Burt and Saegmuller solar attachments. The students are trained to find latitude and time by means of the sextant. Third term, Junior year. Two periods per week.

BIOLOGY.

Professor Davison and Mr. Foster.

The work in this Department occupies all of the ten rooms in Jenks Biological Hall. A general laboratory, forty by sixty feet, and four special laboratories well equipped with modern apparatus, in addition to an herbarium and vivarium provide ample facilities for pursuing practical studies on plant and animal life.

The courses in Biology, excepting Sanitary Biology required for the Civil Engineers and Chemists, are elective only, and consist of work throughout the Junior and Senior years. They are open for election to Classical, Latin Scientific, and General Scientific students. In order to meet the double purpose of a professional preparation and general culture, the courses are so arranged as to provide in each the special knowledge required without sacrificing the ends of general culture and discipline which is sought in all the undergraduate courses. Those not wishing to take the complete course, and yet desiring to know the meaning of the life forms, the relation of plants and animals to one another and especially to man, and to understand the factors and methods of evolution, should pursue the work of the last two terms of the Junior year and the first term of the Senior year. One may, however, begin his biological studies at any time prior to the second term of the Senior year. The work of the second and third terms of the Senior year is designed for those expecting to enter the professions of teaching or medicine.

551. MAMMALIAN ANATOMY.—This enables the student to secure a definite idea of the structures of his own body, to understand some of the evidences of evolution of animals and realize the unity of structure of the animal kingdom. A discussion of parts of the cat or dog together with studies and demonstrations on certain dissected mammals with special reference to the nervous system makes an excellent preparation for the study of Psychology and Physiology. Elective. First term, Junior year. Two periods per week.

552. VERTEBRATE ZOÖLOGY.—The laboratory work involves a study of one or more types representing each of the five classes of vertebrates. The evolution of the various organs and

systems and the origin and development of certain forms of animals together with their habits and natural history furnish fertile topics for recitations and lectures. This course, in connection with General Biology, Course 553, gives the student a general survey of the entire animal kingdom. Elective. Second term. Junior year. Four periods per week.

553. General Biology.—The morphology and life history of a few types of the invertebrates are studied with a view to understanding the processes of life and the relation of one form of life to another. Darwinism and the allied problems struggle for existence, parasitism, etc., are discussed, and considerable attention is given to the interdependence of animals and plants, and insects and birds. A well-equipped laboratory with microscopes, aquaria and terraria, offering access to numerous specimens living and preserved, furnishes every advantage to those pursuing this course. Elective. Third term, Junior year. Four periods per week.

554. Bacteriology and Health.—Preparation: 551, 553 or 571. This work occupies four periods per week during the first term of the Senior year. A considerable amount of laboratory work, supplemented by investigations in a well-equipped library, and by lectures and demonstrations, is applied to a study of the form, habits and use of bacteria, their relation to agriculture, to industrial processes and to disease. Incubators, water-baths, sand and domestic filters, and microscopes equipped with oil immersion lenses enable the students to make a practical study of the cause and prevention of disease, including disinfection, disposal of sewage, sanitary analysis of water and milk. The necessity and method of ventilation and natural and artificial immunity are treated in the light of the twentieth century knowledge. Elective. First term, Senior year. Four periods per week.

555. Physiology.—Preparation: 551, 553 or 554. The laboratory work consists of the performance of certain experiments and a microscopic study of the chief organs in man. The recitations and lectures are devoted chiefly to the physiological problems relating to the digestive, vascular, respiratory, excretory and

nervous systems. Elective. Second term, Senior year. Four periods per week.

556. EMBRYOLOGY AND EUGENICS.—Preparation: 551 or 552 and 555. The maturation and fertilization of the egg of Ascaris, the segmentation of the egg and the formation of the germinal layers in fish and amphibians, and the origin and early development of the chief organs in chick embryos, and the derivation and function of the fetal membranes in birds and mammals constitute the laboratory work. Either Course II or III, and Course VI are required as a preparation for this course. Elective. Third term, Senior year. Four periods per week.

561. SANITARY BIOLOGY.—The cause and prevention of disease, the rôle of bacteria in the septic tank; the effect of polluted water on health; biological analysis of water. The Biological Laboratory is used by students in this course prior to their work in Water Supply and Sewerage. It contains equipment fitted for the study of Sanitary Biology, *viz.*, twenty compound microscopes, a dozen aquaria, several sets of Sedgwick-Rafter apparatus, modern sand and house filters, drying ovens, sterilizers, incubators, fermentation tubes, petri dishes, etc., furnishing the necessary facilities for a practical study of the algae, aquatic animals and bacteria relating to sewage disposal and water supply. Required for Civil Engineers and Chemists. Elective for others. Third term, Junior year. Two periods per week.

571. BOTANY.—The time is largely devoted to the study of the morphology and life history of the lower plants from bacteria to ferns and an explanation of the physiological processes in plants. The relation of insects to plants and plants to man, together with the problem of breeding new varieties, are some of the practical topics considered. Excellent advantages for pursuing this branch are offered by the well-equipped laboratory and extensive College Herbarium containing representatives of nearly all the mosses, ferns and flowering plants in Pennsylvania in addition to hundreds of species from other regions of North America. Elective. First term, Junior year. Two periods per week.

HYGIENE.

Professor Davison.

580. Lectures on Health and the general principles of Physiology illustrated with Stereopticon views, charts, and other apparatus. First term, Freshman year. One period per week.

PHYSICAL CULTURE.

Mr. Bruce.

581. PHYSICAL CULTURE.—The work of this department is carried on in the gymnasium, and physical training is required of all students of the Freshman Class, four periods per week.

SYSTEM.

The course in physical training embraces educational gymnastics, systematic bodily exercises based on scientific principles and founded on physiological rules.

ANTHROPOMETRY AND PHYSICAL DIAGNOSIS.

The student before entering on the course must present himself to the Director for a physical examination. By means of this examination the physical condition of the individual is ascertained. The relative proportions of the parts of the body; the undue development of some muscles and the relaxed and enfeebled condition of others; the comparative size of body and limbs; variations of height, breadth, weight, and muscular strength from the normal standard of a given age are all taken into account in prescribing the course of training. The results of this examination are plotted on anthropometric charts and directions given in booklet form for developing the various parts of the body and correcting individual defects. At the end of the course a second examination is made and the results plotted on the same chart, thus showing the student his exact physical improvement.

OPTIONAL COURSES.

Optional courses are offered to upper classmen in advanced gymnastics and instruction in the science of fencing and of wrestling.

In connection with this course a series of indoor games are introduced. The gymnasium is equipped with regulation handball courts and a series of tournaments are held during the second term.

Outdoor exercise is encouraged and cross-country running in a mild form is promoted for the benefit of students who are not members of athletic teams.

CIVIL ENGINEERING.

Professors Porter and Lyle and Messrs. Spengler, Lohr, Williams and Van Buskirk.

601. SURVEYING.—Theory relating to the construction and use of instruments. Field problems in the manipulation and use of the chain, compass, transit and level. Area Computations. Drafting. Text-book—Breed and Hosmer's Plane Surveying. Third term, Freshman year. Two periods per week.

602. SUMMER SCHOOL.—Recitations and lectures on Surveying Methods. Adjustments of Instruments. Profile Leveling. Survey of the College Campus. Map. Three weeks in vacation at end of Freshman year.

603. TOPOGRAPHIC SURVEYING.—Stadia Survey of a portion of the College Campus. Map. Locating contours and cross sectioning with Hand Level. Contour Problems. Theory and use of the Plane Table. Text-book—Breed and Hosmer's Surveying. Vol. I and II. First term, Sophomore year. Two periods per week.

604. HIGHER SURVEYING.—Theory of trigonometric and barometric leveling, aneroid, precise leveling and base line measurements. Hydrographic and photographic surveying. Field work. Text-book—Breed and Hosmer's Surveying. Vol II. Third term, Junior year. Two periods per week.

611. RAILROADS.—Simple, reverse, compound and vertical curves. Problems. Drafting. Text-book—Allen's Railroad Curves and Earthwork. Second term, Sophomore year. Two periods per week.

612. RAILROADS.—Turnouts, Cross-overs, and Transition Curves. Field problems. Paper location of a railroad. Estimate of cost. Drafting. Text-book—Allen's Railroad Curves and Earthwork. Third term, Sophomore year. Two periods per week.

613. SUMMER SCHOOL.—Railroad reconnaissance. Preliminary and final location. Cross sectioning. Slope staking. Map. Three weeks in vacation at end of Sophomore year.

614. RAILROADS.—Methods of computing earthwork. Construction and use of tables and diagrams. Problems. Completion of Summer School Map. Computation of earthwork from notes of Summer School Survey. Profile. Mass diagram. Text-book—Allen's Railroad Curves and Earthwork. First term, Junior year. Three periods per week.

615. RAILROADS.—Economic location. Traffic. Operating expenses. Cars and locomotives. Railroad structures. Problems. Text-book—Webb's Railroad Construction. Second term, Junior year. Two periods per week.

621. APPLIED MECHANICS.—Statics. Forces, equivalence of force systems, centroids, general principles of equilibrium and application of the principles of equilibrium. Text-book—Maurer's Technical Mechanics, Part I. Third term, Sophomore year. Four periods per week.

622. APPLIED MECHANICS.—Kinematics.—Rectilinear and curvilinear motion, motion of a rigid body. Kinetics.—Motion of a particle, and of a system of particles, translation of a rigid body, rotation, work and energy. Text-book—Maurer's Technical Mechanics, Part II. First term, Junior year. Four periods per week.

623. MECHANICS OF MATERIALS.—The principles of stress and strain; the behavior of materials under tension, compression and shearing; investigation and design of pipes, riveted joints,

boilers and standpipes; strength and flexure of simple and cantilever beams. Report on the carrying capacity of a floor. Text-book—Merriman's Mechanics of Materials. First term, Junior year. Four periods per week.

624. MECHANICS OF MATERIALS.—Restrained and continuous beams; columns; shafts; reinforced concrete. Impact and fatigue; true and internal stresses; mathematical theory of elasticity. Design of an I-beam highway bridge and of a steel standpipe. Text-book—Merriman's Mechanics of Materials. Second term, Junior year. Four periods per week.

625. GENERAL TESTING LABORATORY.—Study and use of testing machines. Commercial tension tests of iron and steel. Modulus of elasticity in tension and compression. Shear tests of iron, steel and wood. First term, Junior year. Two periods per week.

626. GENERAL TESTING LABORATORY.—Transverse tests of cast iron and wood; modulus of elasticity of steel in bending; tests of wooden columns; torsion tests of iron and steel; calibration of testing machines; modulus of elasticity of concrete; reinforced concrete beams. Second term, Junior year. Two periods per week.

631. ROADS AND PAVEMENTS.—Location, construction and maintenance of town and country roads, city streets and pavements. Street cleaning. Text-book—Baker's Roads and Pavements. Second term, Junior year. Two periods per week.

632. ROAD MATERIAL LABORATORY.—Standard tests of paving brick and road metal. Second term, Junior year. One period per week.

641. MASONRY.—Classification and properties of stone, building brick, common and hydraulic lime, sand, gravel and broken stone. Stone-cutting, stone and brick masonry. Ordinary and pile foundations. Foundations under water. Retaining walls, bridge abutments, bridge piers and culverts. See also Courses **652** and **642**. Text-book—Baker's Masonry. Third term, Junior year. Two periods per week.

642. MASONRY DESIGN.—Design of a high masonry dam and masonry arch, using both graphical and numerical processes. Notes. First term, Senior year. Two periods per week.

651. CEMENT.—The study of composition and method of manufacture of cement. Interpretation and method of performing different physical tests. Inspection and sampling of cement. Visit to cement mills. Standard methods of testing and specifications for cement. Text-book—Taylor's Practical Cement Testing. First term, Junior year. Two periods per week.

652. CONCRETE, PLAIN.—Materials, laws of proportioning, forms for concrete, making and placing of concrete, strength, weight, and cost, concrete building blocks and artificial stone. See also Course **641**. Text-book—Baker's Masonry. Second term, Junior year. Two periods per week.

653. CONCRETE, REINFORCED.—Properties of material, contraction and expansion, fireproofing, steel requirements, concrete and steel in combination. The theory and design of slabs, beams, and columns. Text-book—Hool's Reinforced Concrete Construction, Vol. 1. Third term, Junior year. Two periods per week.

654. CEMENT LABORATORY.—Routine tests of Portland cements are made in accordance with the standard methods and specifications, the aim being to have the student become thoroughly acquainted with each standard test and to appreciate the significance of the results obtained. Special tests are also assigned to each student. Notes. First term, Junior year. Two periods per week.

655. CONCRETE LABORATORY.—Mechanical analysis of the materials for concrete. Proportioning and mixing, preparation of plain and reinforced concrete specimens for future tests. Notes. Second term, Junior year. Two periods per week.

656. REINFORCED CONCRETE LABORATORY.—Tests on plain concrete specimens to determine the stress deformation curve in tension and compression. Modulus of elasticity. Tests on reinforced beams to determine deflection and fiber stress distribution, location of neutral axis, and comparison of actual results with those given by various formulas. Third term, Junior year. Two periods per week.

661. HYDRAULICS.—Hydrostatics, hydraulic instruments, orifices, weirs and tubes. Text-book—Merriman's Hydraulics. Third term, Junior year. Three periods per week.

662. HYDRAULICS.—Pipes, conduits; rivers; water power; dynamics; overshot, undershot and breast wheels; impulse wheels; turbines. Text-book—Merriman's Hydraulics. First term, Senior year. Three periods per week.

663. HYDRAULIC LABORATORY.—Tests are made on the circular orifice, the Venturi meter, water meters and weirs. Third term, Junior year. One period per week.

664. HYDRAULIC FIELD WORK.—Measurements of the flow of a stream by use of the current meter. Notes. First term, Senior year. Two afternoons.

671. SEWERAGE.—The disposal of sewage and garbage. The determination of the size and capacity of sewers, inlets and flush tanks. Construction methods. Text-book—Folwell's Sewerage. First term, Senior year. Two periods per week.

672. SEWERAGE DESIGN.—Design of a sewer system for a small city with map and profiles. Notes. Second term, Senior year. Two periods per week.

681. WATER SUPPLY.—The requisites for a good water; the available sources of supply; the construction of pumping plants, reservoirs and pipe lines; purification of water and its distribution to the public. Text-book—Turneaure and Russell's Public Water Supplies. Second term, Senior year. Three periods per week.

682. WATER SUPPLY DESIGN.—Design of a water-supply system for a small city. Notes. Third term, Senior year. Two periods per week.

690. FRAMED STRUCTURES.—The theory and computation of stresses in simple roof and bridge trusses and towers, under dead, live and wind loads. Notes. Third term, Junior year. Two periods per week.

691. ROOFS AND BRIDGES.—The theory and computation of stresses in simple roof and bridge trusses and towers, under dead, live and wind loads. Railroad bridges under locomotive wheel, excess and equivalent loads. Stress sheets. Notes. First term, Senior year. Two periods per week.

692. ROOFS AND BRIDGES.—The theory and computation of stresses in continuous, partially continuous, draw and cantilever trusses. Notes. Second term, Senior year. Six periods per week.

693. ROOFS AND BRIDGES.—The theory and computation of stresses in suspension bridges and three-hinged arches. Notes. Third term, Senior year. Five periods per week.

694. ROOF DESIGN.—Complete computations and design drawing for a wooden roof truss with bill of materials and cost sheet. Notes. First term, Senior year. One period per week.

695. BRIDGE DESIGN.—Complete computations and design drawing of a plate girder for railroad purposes, in accordance with standard specifications. Bill of materials, weights and estimate of cost. Notes. Second term, Senior year. Two periods per week.

696. BRIDGE DESIGN.—Complete computations and design drawing of a through pin-connected railroad bridge in accordance with standard specifications. Bill of materials, weights and estimate of cost. Notes. Third term, Senior year. Five periods per week.

698. GRAPHIC STATICS.—Analysis of stresses by the force and equilibrium polygon, applications to the discussion of beams and girders. Analysis of stresses in roof and bridge trusses. Notes. First term, Senior year. One period per week.

699. THESIS.—A thesis is required of every student as a condition of graduation, upon a subject appropriate to and approved by the Department. All laboratories and other apparatus belonging to the Department may be used for thesis purposes. Third term, Senior year. Two periods per week.

MINING ENGINEERING.

Professor Marquard and Mr. Hatch.

701. MINE SURVEYING.—Instruments. Stations. Underground traversing. Method of connecting surface and underground surveys. Use of top, side and solar telescopes. Mapping. Mineral land claims. Problems. Second term, Junior year. Two periods per week.

706. PROSPECTING.—Physical characteristics of deposits. Geological indications. Prospecting for placer, vein and bedded deposits. Preliminary workings. Sampling. Examination. Valuation. Location of mineral claims. Second term, Junior year. Two periods per week.

711. DEEP BORING.—Use and location of bore holes. Rod boring. American system of cable drilling. Diamond drilling. Davis-Calyx, Matther-Platt, and Kind's systems of drilling. Survey of bore holes. Shaft sinking by boring. Third term, Junior year. One period per week.

716. BLASTING AND QUARRYING.—Explosives. Black powder, nitroglycerine, and its compounds; other high explosives and their use. Tools for boring blast holes, and the amount of charge. Firing by squib, and electricity. Slate, cement and stone quarrying. Third term, Junior year. One period per week.

721. SHAFT SINKING, DRIFTING, TUNNELING.—Shaft excavation and timbering. Location. Alignment. Level stations in the shaft. Special sinking methods; piling drums, freezing process, Triger's method, Kind-Cauldron system. Lippman's system. Tunneling methods in hard and soft rock. Systems of tunneling. First term, Senior year. Two periods per week.

726. EXPLOITATION.—Open cut work. Hydraulic mining. Gold dredging. Coal mining methods. Metal mining methods. Stoping methods. Slicing, caving, filling, block caving, room and pillar methods of mining ore. Methods of mine development. Maps to illustrate. Salt mining. First term, Senior year. Two periods per week.

731. TRANSPORTATION.—Arrangements for loading and unloading cars and bins on surface and underground. Underground haulage: animal, electric, rope, steam, and air. Self-acting planes. Hoisting drums, brakes, motors, ropes, guides. Safety appliances. Signals. Second term, Senior year. Two periods per week.

736. VENTILATION AND LIGHTING.—Air in mines. Mine gases. Testing air. Analysis of mine gases. Natural, furnace ventilation. Positive blowers. Centrifugal fans. Theory and efficiency of fans. Measurement and control of air currents. Resistance of air ways. Explosions. Laws. Method of lighting. Safety lamps, electric lights. Laws. Second term, Senior year. Three periods per week.

741. MINE DRAINAGE.—Source and action of mine waters. Mine pumps. Water column pipes. Dams. Hoisting buckets. Drainage tunnels. Siphons. Operation of pumps by electricity and compressed air. Theory and efficiency of centrifugal pumps. Third term, Senior or Junior year. Three periods per week.

746. MINE CONSTRUCTION.—Study of stresses in beams, columns and girders by graphic statics. Design of a mine gangway set. Shaft timbering. Square set timbering methods. Design of flumes and trestles. First term, Senior year. Two periods per week.

747. MINE CONSTRUCTION.—Masonry, foundations, retaining walls Stresses in trusses by graphic statics. Design of a roof truss. Second term, Senior year. Two periods per week.

748. MINE CONSTRUCTION.—Design of ore bins, head frame, tipples, and mill buildings. Third term, Senior year. Two periods per week.

751. ORE DRESSING.—Hand picking. Principle of crushing, and concentration. Crushers: jaw and gyratory, rolls, stamps, Huntington mill, Chilean mill, arastras. Classifying machinery: trommels, grizzlies, shaking screens, hydraulic classifiers, settling ponds, spitzkastens. Concentrating machinery: jigs with theory of jigging, vanners, tables, magnetic con-

centrators, amalgamation. Third term, Senior or Junior year. Four periods per week.

756. MINE MACHINERY.—Coal cutters, drills, hoists, cableways, motors, blast firers, air compressors. Theory of air compression and method of using and conducting compressed air. Second term, Senior year. Two periods per week.

761. MINE ADMINISTRATION.—Organization, administration and management. Mine accounts and cost keeping. Third term, Senior year. Two periods per week.

766. MINING LAW.—Review of the mining laws of the various countries. General principles of real estate law with respect to minerals. United States mining laws. State laws and local regulations. Third term, Senior or Junior year. Two periods per week.

771. THESIS.—A graduating thesis is required of each candidate for a degree. This thesis must be an original design or review of some process, machinery or plant related to mining operations. The subject of the thesis is assigned by the department along lines of special interest to the student.

ELECTRICAL ENGINEERING.

Professors Rood and Tanzer.

804. ELEMENTS OF ELECTRICAL ENGINEERING.—A special course designed for students in Civil, Mechanical and Mining Engineering. Elective for General Scientific and Latin Scientific students. Electricity and magnetism; electrical measurements; electrical illuminants; lighting systems; dynamos; motors; alternating current machinery; transformers. First term, Junior year. Three periods per week.

806. ELECTRICAL PROBLEMS.—Solution of elementary problems relating to direct current engineering. First term. Junior year. Two periods per week.

807. ELECTRICAL PROBLEMS.—A continuation of **806.** Solution of problems relating to more advanced direct current engineering and to elementary alternating current engineering. Second term, Junior year. Two periods per week.

811. ALTERNATING CURRENTS.—Fundamental principles governing circuits having a variable E.M.F.; effect of resistance, inductance and capacity; generalized Ohm's law. First term, Junior year. Three periods per week.

812. ALTERNATING CURRENTS.—A continuation of 811. Alternator regulation; single, two- and three-phase circuits; measurement of power in polyphase circuits; theory of the transformer, single and polyphase transformers; methods of phase transformation. Second term, Junior year. Three periods per week.

821. ELECTRICAL LABORATORY.—Introduction to Laboratory methods and practice; measurements of resistance by drop method; insulation test; magnetic leakage; fuses; voltmeter and ammeter calibration by various methods; recording meters. First term, Junior year. Two periods per week, reports.

822. ELECTRICAL LABORATORY.—A continuation of 821. Tests upon arc and incandescent lamps; photometry; magnetization and characteristic curves of dynamos; tests of armature reactions. Second term, Junior year. Two periods per week, reports.

823. ELECTRICAL LABORATORY.—A continuation of 822. Parallel running of generators; investigation of commutator losses; elementary tests with alternating currents; effects of inductance and capacity Third term, Junior year. Two periods per week, reports.

824. ELECTRICAL LABORATORY.—Motor and dynamo characteristics, A. C. wave form; magnetization and characteristic curves of alternating current generators, efficiency and regulation tests of transformers. First term, Senior year. Two periods per week, reports.

825. ELECTRICAL LABORATORY.—A continuation of 824. Tests of induction and synchronous motors; transformer groupings and resultant ratios; phase transformation; power transmission; transmission losses and efficiencies. Second term, Senior year. Two periods per week, reports.

826. ELECTRICAL LABORATORY.—A continuation of 825. Motor-

generator tests; investigation of the rotary converter and its losses and characteristics; dielectric strength of insulating materials; resonance; the oscillograph. Third term, Senior year. Two periods per week, reports.

827. ELECTRICAL LABORATORY.—A special laboratory course designed for students in Civil, Mechanical and Mining Engineering. Elective for General Scientific and Latin Scientific students. Fundamental experiments in calibrations, photometry, direct current generator characteristics. Second term, Junior year. Two periods per week.

828. ELECTRICAL LABORATORY.—A continuation of 827. Motor characteristics, motor and dynamo efficiencies, alternating current motor and transformer tests. Third term, Junior year. Two periods per week.

831. ENGINEERING ABSTRACTS.—The review and discussion of articles and papers of value in current engineering literature. Throughout Junior and Senior years. One period per week.

841. ELECTRICAL DESIGN.—The design and calculation of rheostats, controllers, wiring systems and machines. First term, Senior year. Two periods per week.

842. ELECTRICAL DESIGN.—A continuation of 851. Design and calculation of advanced types of electrical machinery, generators, motors and transformers. Second term, Senior year. Two periods per week.

851. MOTOR ENGINEERING.—A detailed consideration and comparison of the various types of constant and multi-speed direct and alternating current motors, their control, proper fields of use; types and methods of machine drives; power requirements of various commercial processes. Second term, Junior year. Three periods per week.

852. ILLUMINATING ENGINEERING.—A review and close study of the modern type of illuminants, gas and electric; photometry and standards of light; candle power distribution; effective illumination; reflectors, shades and globes, their effects and losses; location of lights; wall reflection and absorption. Third term, Junior year. Three periods per week.

853. ELECTRIC RAILROADS.—Systems of distribution; rail-bonds and bond testing; electrolysis; direct current motors and controllers; single-phase commutator motors, train operation and control, speed-time curves. Third term, Senior year. Five periods per week.

861. ELECTRIC POWER TRANSMISSION.—Low potential direct and alternating current distributing systems; calculation of losses and drop; house and factory wiring and systems; fire hazards and their prevention; high potential lines, their construction and maintenance; lines and line losses. First term, Senior year. Four periods per week.

871. ELECTRIC POWER STATIONS.—A study of the considerations affecting the selection, erection and maintenance of steam and electric power plant machinery, and the assembling of such a machinery to form an economical plant for the production of electric power and light. Second term, Senior year. Three periods per week.

872. HYDRO-ELECTRIC ENGINEERING.—The fundamental principles of hydro-electric engineering; types, and forms of powerhouses; the types, proper selection and erection of turbines and governors, generating, switching and transmission apparatus. Third term, Senior year. Four periods per week.

881. THE TELEPHONE.—A study of all the modern telephone systems with a review of the earlier systems and development. Third term, Senior year. Five periods per week.

891. THESIS.—A thesis is required of every student as a condition for graduation, the topic assigned or approved by the head of the Department. The thesis must show the result of individual investigation and research.

CHEMISTRY AND METALLURGY.

Professors Hart and Wysor and Messrs. DeLong, Ross and Pfromm.

901. ELEMENTARY DESCRIPTIVE INORGANIC CHEMISTRY.—Brief course in the chemistry of the non-metals and metals com-

prising lectures, preparatory work, and recitations. Third term, Sophomore year. Two periods per week.

902–3–4. QUALITATIVE ANALYSIS AND QUANTITATIVE ANALYSIS (Begun).—First, second and third terms, Junior or Senior year. Two periods per week.

905–6–7. QUANTITATIVE ANALYSIS.—Elective Course: The work of which is varied to meet the requirements of the student. First, second and third terms, Senior year. Two periods per week.

908–9–10. ORGANIC CHEMISTRY.—Elective course. First term laboratory. Second and third terms, laboratory and quiz. First, second and third terms, Senior year.

911. DESCRIPTIVE INORGANIC CHEMISTRY.—Lectures, quizzes and laboratory work. First term, Freshman year. Four periods per week.

912. ADVANCED INORGANIC CHEMISTRY.—The law of gases. The chemical balance. Diffusion and dissociation. Principles of quantitative analysis. Recitations and laboratory work. Second term, Freshman year. Two periods per week.

913. QUALITATIVE ANALYSIS (Begun).—Third term, Freshman year. Two periods per week.

914. QUALITATIVE ANALYSIS (Continued).—First term, Sophomore year. Six periods per week.

915. QUALITATIVE ANALYSIS (Completed).—Second term, Sophomore year. Six periods per week.

916. QUANTITATIVE ANALYSIS (Begun).—Third term, Sophomore year. Six periods per week.

917. CHEMICAL ARITHMETIC.—Third term, Sophomore year. Three periods per week.

918. QUANTITATIVE ANALYSIS (Continued).—First term, Junior year. Five periods per week.

919. THEORETICAL CHEMISTRY including special determination in the laboratory. First term, Junior year. Two periods per week.

BRAINERD HALL.

920. ORGANIC CHEMISTRY (Begun).—Laboratory work. First term, Junior year. Four periods per week.

921. ORGANIC CHEMISTRY (Continued).—Lectures, recitations and laboratory work. Second term, Junior year. Four periods per week.

922. ORGANIC CHEMISTRY (Completed).—Third term, Junior year. Four hours per week.

924. THEORETICAL CHEMISTRY (Continued).—Second term, Junior year. Two periods per week.

925. THEORETICAL CHEMISTRY (Completed).—Third term, Junior year. Two periods per week.

926. QUALITATIVE ANALYSIS (Begun) (Shorter Course).—Second term, Freshman year. Two periods per week.

927. QUALITATIVE ANALYSIS (Completed) (Shorter Course).—Third term, Freshman year. Two periods per week.

928. QUALITATIVE ANALYSIS (Advanced Course).—First term, Sophomore year. Two periods per week.

929. QUALITATIVE ANALYSIS (Continued) (Advanced Course).—Second term, Sophomore year. Two periods per week.

930. QUANTITATIVE ANALYSIS (Begun) (Shorter Course).—Third term, Sophomore year. Two periods per week.

931. QUANTITATIVE ANALYSIS (Continued).—Second term, Junior year. Five periods per week.

932. QUANTITATIVE ANALYSIS (Continued).—Third term, Junior year. Four periods per week.

933. QUANTITATIVE ANALYSIS (Continued).—First term, Senior year. Ten periods per week.

934. CHEMICAL ENGINEERING.—The Elements of Chemical Engineering. First term, Senior year. Two periods per week.

935. CHEMICAL TECHNOLOGY.—Manufacture of "heavy chemicals." Second term, Senior year. Two periods per week.

951. METALLURGY.—Properties of Metals. Refractory materials and fluxes; furnaces; fuels and thermo measurements; ore dress-

ing; iron and steel. First term, Junior year. Two periods per week.

952. METALLURGY.—Lectures, recitation and laboratory. Second term, Junior year. Two periods per week.

953. METALLURGICAL CHEMISTRY.—Elective. First term, Senior year. Two periods per week.

954. METALLURGICAL CHEMISTRY (Continued).—Elective. Second term, Senior year. Two periods per week.

955. ASSAYING.—Second term, Senior year. Two periods per week.

961–2–3. TECHNICAL GERMAN.—Translation of Chemical works from the German. First, second and third terms, Junior year. One period per week.

964–5–6. TECHNICAL GERMAN (Continued).—First, second and third terms, Senior year. One period per week.

971. THESIS WORK.—Second term, Senior year. Four periods per week.

972. THESIS WORK (Completed).—Third term, Senior year. Twelve periods per week.

973. AGRICULTURAL CHEMISTRY (optional).—Second term, Senior year. One period per week.

974. LEAD BURNING (Optional).—Second term, Senior year. One period per week.

MECHANICAL ENGINEERING.

Professor Fitch and Messrs. Pearce, Wasser, Wallaesa, Carpenter, Mitman and Durner.

1001. SHOP WORK.—The Civil Engineers, Mining Engineers, and Chemists spend the Sophomore year in the shops, two periods per week, the time being divided between the Pattern Shop, Foundry, Machine Shop, and the Forge.

The Mechanical Engineers and the Electrical Engineers spend both the Sophomore and the Junior years in the shops, two periods per week.

PATTERN SHOP.—Use and care of hand tools, study of the materials used, the reading of drawings, the study of the relation of pattern making to molding. Pattern turning between centers and on face plates. Study of solid and hollow castings and the construction of their patterns, including core-prints and core-boxes; study of shrinkage, fillets, draft, finish, reasons for finishing in color, etc. Study of machines used in pattern shops.

FOUNDRY.—Tempering and mixing sands, facing preparations, the use and care of tools and shop equipment, ramming, gating, venting, risers, weighting, and the use of jackets. Duplicate and multiple production. The making, drying, venting, handling, and setting of cores. Sand and plaster matches. Management of the cupola and care of ladles. Exercises in skim gates, shrink heads, stopping off, opens and sweep work, loose piece moulding, and the use of chills. Dry sand and loam are taken up with suitable examples. Castings are first made in white metal for practice, and then in brass or cast iron.

MACHINE SHOP.—Exercises on the lathe, shaper, miller, planer, drill press, and cold saw, enabling the student to become familiar with the use and operation of the various parts of the machines. The advanced student is given repair work such as is necessary in the department.

FORGE, SHEET METAL AND PIPE SHOP.—Exercises in drawing, upsetting, forming, and welding of iron and steel, use of tools such as fullers, swages, sets, etc., tool making, annealing, hardening and tempering of steels, oil tempering, case hardening, brazing, chipping and filing to size. Sheet metal work: use of tools, laying out, forming, soldering, brazing, riveting, making laps, and wiring. Pipe work: use of tools, cutters, tongs, etc., cutting and threading to fit, making joints such as rubber, wire gauze, and asbestos gaskets, and lead joints, to stand test pressures.

1011. MECHANISM.—The study of the motions and forms of mechanisms occurring in machines, also the study of mechanisms found in modern machine tools. The course also includes the design of gear teeth, the theory and practice of designing valve gears and governors for steam engines. Three terms, Sophomore year. Two periods per week.

1013. DYNAMICS OF MACHINES.—A study of the action of reciprocating parts, fly wheels, etc. This course is given in connection with the course in Machine Design. Third term, Senior year. Two periods per week.

1012. MACHINE DESIGN.—The designing of simple machines, pumps, cranes, and engines, involving gears, power transmission, cables, chains, etc., and a study of friction and of the action of reciprocation parts. If time permits, the design of a steam or gas power plant may be taken up. (Lecture sand drafting room.) Three terms, Senior year. Three periods per week.

1021. BOILERS.—The study of the various types of steam boilers, and their auxiliaries, and the accessories of a steam plant. Some design work is given in connection with this course in order that the student may become more familiar with the construction and details of steam boilers. First and second term, Junior year. Three periods per week.

1022. TURBINES.—A study and design of the various types of turbines and their auxiliaries, and their application to power problems. Second and third terms, Senior year. Three periods per week.

1023. STEAM ENGINEERING.—Primarily a descriptive course dealing with the selection, adjustment, care and repair of various types of engines, turbines, boilers, pumps, and all accessories. Higher mathematics and theory is reduced to a minimum, for the object of this course is not to teach the design of steam apparatus, but the intelligent operation of same. (Lectures and recitations.) Second term, Junior year. Three periods per week.

1024. THERMODYNAMICS.—The theory of heat, and its applications to engineering. Perfect gases, steam, hot air engines, steam engines, turbines, injectors, refrigerating machines. (Lectures and recitations.) First and second terms, Senior year. Four and three periods per week.

1025. STEAM ENGINES.—A study of the various types of engines with their auxiliaries and their applications. Third term, Junior year. Three periods per week.

1051. HEATING AND VENTILATION.—Heating of buildings by hot air—natural draft and forced; hot water, and steam—direct and indirect radiation. Ventilation of buildings. Computations and sketches for assigned problems. (Lectures and recitations.) Third term, Senior year. Four periods per week.

1061. INDUSTRIAL MANAGEMENT.—A study of piece work and flat rates; time and cost keeping; organization of working force; location of factories, production of product; contracts, specifications, etc. (Lectures and recitations.) First term, Senior year. Two periods per week.

1072. THESIS.—A thesis is required of every student as a condition of graduation. The subject may be chosen by the student, but it must be approved by the Department. The shops, laboratories, and all apparatus belonging to the Department may be used for this work. Third term, Senior year. Two periods per week.

1073. ENGINEERING ABSTRACTS.—Each student is required to read a prepared paper on some engineering subject before the class. Discussion of this paper is then taken up by the class. Third term, Junior year. Two periods per week.

GENERAL INFORMATION.

ATTENDANCE.

Attendance on all college exercises is strictly required. Absences on account of sickness, or for other satisfactory cause, may be excused, and leave of absence will be granted at the request of parents when absolutely necessary. In such cases the absence is excused, but the student is invariably required to make up such work as he may lose by reason of his absence. Reports are sent to parents whenever the absences of their sons exceed a reasonable number. In case of the absences becoming excessive the faculty will punish the neglect with suspension. Absences incurred at the beginning and end of a term, especially if they involve absence from examinations, and immediately preceding and succeeding holidays, are regarded with special disapproval, and under ordinary circumstances will not be excused.

Each student is expected to have at least sixteen recitations each week. No student is permitted to take a course involving fewer hours of recitation without a special vote of the Faculty. Three hours of field or laboratory work are regarded as equivalent to one recitation period. The regular gymnasium drills are also regarded as required exercises as far as prescribed.

EXAMINATIONS.

Examinations are held at the close of each term on the studies of that term, and may be either written or oral, or both, at the option of the professor in charge. In addition to these regular examinations, partial examinations and written recitations are held from time to time during the term, with or without notice to the students. Failure, to attend an examination except for reasons of absolute necessity, is regarded as a serious delinquency, and will be dealt with according to the circumstances of each case.

STANDING.

The scholarship of students is determined by the results of the examinations and daily recitations combined.

Students entering with conditions are required to make them up before the end of the term next after that in which they enter.

Students failing to pass in the studies of any term are required to make up such studies before the beginning of the term after that in which the failure occurred, and they may be specially directed to do so at an earlier date. Students who do not comply with these regulations will be put on probation in scholarship, or lose standing and be only "permitted to recite," or be dropped into the next lower class, as the Faculty may in each case decide.

Reports of the standing of the students are made to their parents or guardians at the end of each term.

RULES GOVERNING ABSENCES AND RE-EXAMINATIONS.

1. No absence from a recitation, a lecture or a laboratory exercise shall be excused.

2. If the number of a student's absences in any term from the exercises in any subject exceed the number of exercises per week

in the subject, but not double the number, he may, at the discretion of the Instructor in charge, be debarred from the term examination in the subject, provided the number of absences is not less than three.

If he be debarred, he must pass on the subject before the first day of the next term or repeat the subject with a following class.

3. If the number of a student's absences in any term from any subject exceed double the number of exercises per week in the subject, he shall be debarred from the term examination and must repeat the subject with a following class, provided that the number of such absences must exceed three.

4. If, for special reasons, the head of the department recommend it, the faculty may vote that a student who would otherwise be required to repeat a subject by Rule 3 be given one examination on the subject. If he fails in this examination, he must repeat the subject.

5. Before a student may take the examination provided for in Rule 4, he shall be required to pay to the treasurer of the college a fee of two dollars and show the treasurer's receipt for the same to the teacher in charge of the examination.

6. The Instructor in charge of each subject shall, at the beginning of each week, post in some place easily accessible to the students interested, the number of absences from the exercises of the subject of each student to date.

7. All absences shall be reported weekly to the Clerk of the faculty, who shall record them.

8. When the number of a student's unexcused and unpermitted absences from the religious and other exercises of the college reaches five, he shall be warned by his class dean; when it reaches ten, he shall be again warned; when it reaches fifteen, he and his parents shall be warned that he is in danger of being dropped from the college rolls; when it reaches twenty, he shall be dropped. If at the end of a term a student has twenty such absences he shall have five absences charged against him on the next term for every five or fraction of five absences above nineteen which stand against him.

PERMITTED ABSENCES.

9. In case of absence due to prolonged sickness or request from

home for urgent reasons approved by the Dean, the student shall, as soon after the absence as possible, present to the Dean a written statement of the cause of his absence, after which the Dean shall give the student an exact statement of the duration of his absence, which he shall present to his Instructors, each of whom shall endorse upon it the number of absences from his subject covered by it. The student shall then take it to the Dean, and the absences endorsed upon it shall not be counted by the Clerk in making up the number of Rule 8.

When such permitted absence causes the number of a student's absences in any subject to reach the number which would debar him from the examination, he shall be required to make up the work done by the class during as many of these absences as are required to bring his absences below the debarring number by an examination to be held within a month of the absences.

If he fail in this examination, he shall be debarred from the term examination and required to pass on the subject by a special examination to be held before the first day of the following term. If he fail in this special examination, he shall repeat the subject with a following class.

Before the special examination may be held, the student shall pay to the treasurer of the college a fee of two dollars, and shall show his receipt for the same to the Instructor in charge of the examination.

The student shall be permitted to make up, by examination, all these permitted absences, in which case none of them shall be counted against him.

10. When permission to be absent from town has been given to a student by vote of the faculty or by the President acting for the faculty, such student shall receive from the Dean an exact statement of the duration of such absence, which he shall present to his Instructors, each of whom shall indorse upon it the number of absences from his subject covered by it. The student shall then return it to the Dean and the absences endorsed upon it shall not be counted by the Clerk in making up the number of Rule 8.

When such permitted absences shall cause the number of a student's absences in any subject to reach the number which would debar him from the examination, he shall be required to make up the work done during as many of these absences as are necessary to bring his absences below the debarring number by an examination held within a month of the absence.

If he fail in this examination he shall be debarred from the term examination and required to pass on the subject by a special examination to be held before the first day of the following term. If he fail in this special examination, he shall repeat the subject with a following class.

Before this special examination may be held, the student shall pay to the treasurer of the college a fee of two dollars and shall show this receipt for the same to the Instructor in charge of the examination.

The student shall be permitted to make up, by examination, all these permitted absences, in which case none of them shall be counted against him.

11. If professors, in whose departments a student has the majority of his hours per week, report to the faculty that the student is neglecting his work, he and his parents shall be warned that he is in danger of being dropped from the college rolls. If a second such report be made, he shall be dropped.

EXAMINATIONS AND RE-EXAMINATIONS.

1. No examination shall be given at any time other than that specified in the Examination Schedules.

2. No Professor or Instructor is authorized to excuse an absence from any examination. The College Dean may issue a permit covering absences from examinations, in which case absences become permitted absences, and shall not be counted against the student having the same.

3. A student who is absent from any term examination shall be so reported and conditioned in the subject.

4. Absence from any examination shall be counted as an examination, unless the absence is covered by a permit, or the student has been debarred.

5. A student who has not been debarred, having an unpermitted absence from any term examination, shall be entitled to only one examination, for which he shall pay to the College Treasurer a fee of five dollars and present to the Instructor in charge a receipt for the same on or before the date of the examination. An unpermitted

absence from this examination necessitates the student repeating the subject in course or with a delinquent class.

6. A student who fails at the regular term examination in any subject shall be entitled to one re-examination, unless in the judgment of the head of the department the failure is so complete that the student should be required to repeat the subject.

7. If, for special reasons, the head of the department recommend it, the faculty may vote that a student who has failed in the re-examination provided for in Rule 6 may be given a second re-examination.

8. Before a student can take the second re-examination provided for in Rule 7, he shall be required to pay to the treasurer of the college a fee of two dollars and show the treasurer's receipt for the same to the Instructor in charge of the examination.

9. If, at the beginning of the college year, a student has failed to pass on his conditions of the preceding year in the departments of Mathematics, Mechanics, Physics, French and German, and in Projections and Descriptive Geometry in the department of Graphics, he shall be required to repeat the subjects in which he is still conditioned. "Students in the Chemical Course cannot go on with Chemistry at the beginning of a college year if they are conditioned in Chemistry."

10. When subjects, which closely depend upon each other, are continued throughout successive terms, the department interested may require that all conditions of any terms in those subjects shall be made up within two weeks from the beginning of the next term, in order that the student may go on with those subjects.

11. All students who have one or more conditions in Freshman English at the end of the third term are required to take English with the incoming Freshman class and to remain in the course till they have satisfactorily passed off their conditions. No re-examinations are given in the course.

12. A technical student who fails in mathematics in the second or third term of the Freshman year or in the first or second term of the Sophomore year shall report for re-examination at nine o'clock of the day preceding the first day of the next term and if he fails to make up his condition he shall take an extra class of two hours per week for one term in the subject in which he failed, said class to rank as a regular part of his schedule of study.

CONDITIONS.

1. A student who fails to complete satisfactorily the work prescribed in any subject is permitted to continue his studies upon *condition* that he make up the failure, or remove the condition, within a specified time.

2. Where no other time is fixed the condition must be removed before the beginning of the third term after that in which the failure occurred. If the condition is not made up before that time the student shall repeat the subject.

3. A student shall not be enrolled as a member of the Sophomore class who has any entrance conditions unless by vote of the faculty he be permitted to make up his deficiency by taking an equivalent amount of college work, in addition to his regular schedule, in satisfaction of the condition.

4. A student shall not be enrolled as a member of the Junior class who has any Freshman conditions, nor of the Senior class who has any Sophomore conditions, and all subjects prior to Senior year must be made up before the beginning of the second term of the Senior year in order that the student may be a candidate for a degree at Commencement of that year. A student who would otherwise be a candidate for a degree in that year may be permitted by vote of the faculty to remove conditions by repeating the subjects with a class, but not by a special examination.

5. A student who, at the opening of a college year, has overdue conditions representing more than twelve (12) hours of work shall fall back to the next class.

6. A student who, at the opening of a college year, has overdue conditions representing sixteen (16) hours of work, whether he be a regular or a special student, shall be dropped from the college unless he can arrange to enter a lower class as a regular student with conditions aggregating less than eight hours of work.

NOTE:—By "hours of work" is meant the number of exercises scheduled in that subject for one term.

GRADUATION.

Students who have pursued an entire course as prescribed and have successfully passed their examinations are recommended to the trustees for the first academic degree in course. Such recommendations are ordinarily acted upon and the degrees are conferred at Commencement, at which time the students receive diplomas from the President of the College. At Commencement the faculty awards such honors as it sees fit to those who are to receive degrees. These honors ordinarily consist of a valedictory oration, a Latin salutatory, and other honorary orations and theses.

COMMENCEMENT.

The College year is so arranged as to provide a term of 14 weeks immediately before the Wednesday preceding Christmas day and two terms of 11 weeks each after the Christmas vacation, the vacation at Christmas and in the Spring being two weeks each. The annual Commencement usually falls on the third Wednesday in June, but occasionally the fourth Wednesday. The three days immediately preceding Commencement day are set apart for special exercises. On Sunday, the first of these days, a Baccalaureate sermon is preached in the College chapel at eleven o'clock in the morning; and in the evening a sermon is preached in the auditorium of Pardee Hall before the Brainerd Society of the College by some distinguished minister selected by the Society. The preacher for 1914 was Rev. John R. Davies, D.D., '81, of Philadelphia.

On Monday the Senior class holds its Class Day exercises on the campus.

The alumni and literary societies hold their reunions on Tuesday, and orations are delivered before the literary societies in the Society halls.

The regular Commencement exercises are held in the auditorium of Pardee Hall on Wednesday morning, the afternoon being occupied by the alumni dinner. All these exercises are open to the public. Various other exercises of an athletic or social nature are conducted on the part of the students under a general supervision by the faculty.

DEGREES.

THE FIRST DEGREE.—The degree of *Bachelor of Arts* is conferred on the graduates of the Classical Course; *Bachelor of Philosophy*, on those of the Latin Scientific Course; *Bachelor of Science*, on those of the General Scientific Course; *Bachelor of Science* (in Chemistry), on those of the Chemical Course; *Civil Engineering*, on those of the Civil Engineering Course; *Engineer of Mines*, on those of the Mining Engineering Course; *Electrical Engineer*, on those of the Electrical Engineering Course; *Mechanical Engineer*, on those of the Mechanical Engineering Course.

MASTER'S DEGREE

MASTER OF ARTS.—The degree of *Master of Arts* may be conferred one year after graduation on any *Bachelor of Arts* who has pursued a prescribed course of study, equivalent to sixteen recitations per week, during one year in residence, passed the examinations, and presented a satisfactory thesis.

The same degree may be conferred two years after graduation on any *Bachelor of Arts* who shall have devoted at least one year exclusively to advanced study under the direction of the faculty, passed examinations in the studies pursued, and presented a satisfactory thesis.

Candidates for this degree must, in all cases, register on or before

October 1st, and examination must be held at the College at least once in each college term. Theses must be presented for approval not later than May 1st. A registration fee of $5 and tuition fee of $100 per annum for residents, and $45 per annum for non-residents, is exacted of all graduate students.

MASTER OF SCIENCE.—The degree of *Master of Science* may be conferred upon any graduate of the scientific department upon conditions similar to those prescribed for the degree of Master of Arts.

CERTIFICATES.

Students who have been admitted to any department of the College, and have passed satisfactory examinations therein, may obtain certificates of the work which they have done if they have been in attendance not less than one year.

MEDICAL TREATMENT.

A college physician has been provided for the benefit of the students and for the information of the college authorities and the parents of students in the case of serious sickness. This physician is John Edgar Fretz, M.D.

The regulations with regard to his attendance upon students are as follows:

The college physician shall make one call for diagnosis and prescription at the expense of the College. When called to see students at their rooms he shall make a report of the diagnosis, with a recommendation of the course to be followed, to the Dean of the Students within twenty-four hours.

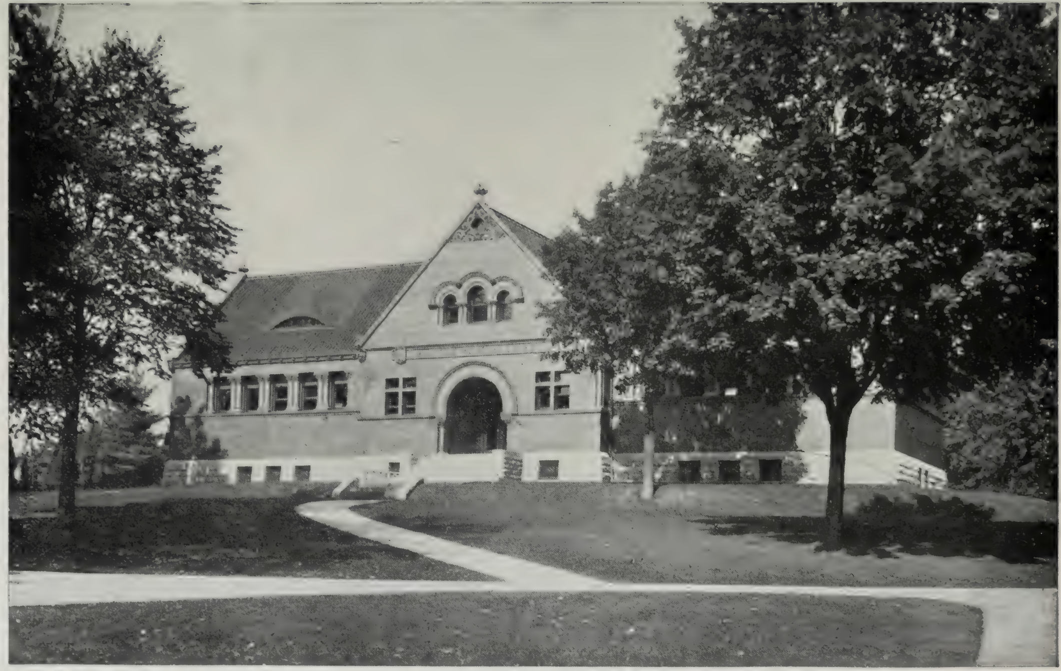
For continued attendance students may make their own arrangement with the college physician or some other physician approved by the college authorities. All calls after the call for diagnosis and all office calls shall be at the expense of the students.

RELIGIOUS INSTRUCTION.

Lafayette College is distinctly Christian and aims to be in full sympathy with the spirit and purpose of the Presbyterian Church. Religious instruction is carried on with a view to the development of Christian manhood and leadership in Christian service, not in any sectarian sense, but in full accord with essential truth as accepted by all evangelical Christians.

Prayers are held each morning in the chapel at 7.50 and religious services in the chapel Sunday mornings at 11 o'clock. All students are expected to attend these services. No exceptions will be made to this rule for morning prayers. Where there is some exceptional reason assigned by the parents, students will be permitted to attend one of the churches in Easton instead of the Sunday morning service. This permission will be granted only on request of parents and for sufficient reason.

Special sermons are preached before the College from time to time by distinguished ministers. The preachers for 1914 were: Rev. William H. Crothers, Philadelphia; Rev. Joseph W. Cochran, D.D., Philadelphia; Rev. George G. Mahy, D.D., Philadelphia; Rev. E. V. Wight, D.D., Middletown, N. Y.; Rev. J. Kinsey Smith, D.D., Pittsburgh; Rev. William C. Isset, Milville, N. J.; Rev. William Henry Roberts, D.D., LL.D., Philadelphia; Rev. Charles R. Erdman, D.D., Princeton, N. J.; Rev. William H. Wells, Olney; Rev. William M. Yeomans,



VAN WICKLE MEMORIAL LIBRARY.

Chestnut Hill; Rev. Robert Hugh Morris, D.D., Philadelphia, Rev. S. Harper Leeper, Media; Rev. James I. Good, D.D., Philadelphia; Rev. Daniel H. Overton, D.D., Islip, N. Y.; Rev. John R. Davies, D.D., Philadelphia; Rev. H. Charles McBride, Tacony; Rev. Robert B. Jack, Hazleton; Rev. Louis Harold Johnston, Patchogue N. Y.; Rev. William E. Brooks, Allentown; Bishop Joseph F. Berry, Methodist Episcopal Church; Rev. William M. Auld, Philadelphia; members of the Faculty and local clergy.

The preacher for the Day of Prayer for Colleges, 1915, was Rev. J. Ross Stevenson, D.D., LL.D., of Princeton, N. J.

Instruction in the Bible has always held a prominent part in the College, and a full account of the courses in Bible study will be found on pages 111–112.

LECTURES.

Special courses of lectures are given annually in connection with several departments and will be found under those departments. A more general course of a popular character is given each year.

TERMS AND VACATIONS.

The College year is divided into three terms, with intervening vacations, as given in the Calendar on page 6. All the classes are examined at the close of each term, and a report sent to the parents or guardian. Students are required to be present punctually at the beginning of each term, and are not allowed during term-time to be absent from town, except by written permission from the Dean.

The Wednesday before the third Thursday of October in each year is observed as Founders' Day, in memory of those who founded the College and of those who have since contributed to its usefulness. On Founders' Day, 1914, an address was delivered by Arthur Holmes, Ph.D., Dean of the General Faculty, Pennsylvania State College, State College, Pa.

BUILDINGS, LABORATORIES, LIBRARIES.

The college grounds are situated upon the summit of a beautiful hill, overlooking the city of Easton. They are reached by a flight of stone steps, which ascend the bold front of the hill directly from the head of Third Street, or by electric cars, which skirt the face of the hill by a gradual incline. At the head of the steps stands the monument erected by the alumni association to their comrades who "died for the Union." The grounds contain about sixty acres terraced and laid out under the direction of Donald G. Mitchell. The buildings upon the campus are forty in number. The oldest of these is

SOUTH COLLEGE.

The central portion of this building was erected in 1833 and was the original college building. At later periods east and west wings were added and the whole building was thoroughly overhauled and modernized in 1909. It now contains a large part of the class and lecture rooms for the academic department, and the basement and first floor of the east wing have been fitted for a lecture room and laboratory for the Department of Mining Engineering.

The first and second floors of the west wings are occupied by the College Chapel. The remaining space in the main building and in the wings is devoted to dormitory rooms which have been thoroughly modernized, and every comfort afforded by modern plumbing and sanitary arrangements has been added.

The building has also been beautified by a portico on the south front and by many improvements in the general finish of the building.

The alterations have been intended to secure every needed improvement without altering the general effect of the building. The sentimental value of its historical place in the college life and thought have not been lost sight of.

PARDEE HALL.

The most commanding position on the campus is occupied by this building, the most conspicuous evidence of the liberality of the late Ario Pardee, which reached to every department of the college. Here the departments of civil, mining, and electrical engineering are supplied with thoroughly equipped laboratories and lecture rooms, and the museums of these departments, and of general geology, mineralogy, and natural history are to be found. The Ward Library and the handsome rooms of the two literary societies are also in this building, and the central portion of the second and third floors of the main building contains a beautiful auditorium in which the Commencement exercises, lectures, and other public entertainments are held.

THE VAN WICKLE MEMORIAL LIBRARY.

The Van Wickle Library Building, the gift of the late

Augustus S. Van Wickle, was dedicated on May 30, 1900. It is beautiful architecturally, constructed of Pompeian brick and terra cotta, and thoroughly furnished with the most approved modern appliances for library work. It contains a large reading room in which the periodicals are to be found, a large room for books of reference and study, a large stack room for the general storage of the library, a librarian's room and smaller rooms for special work.

The stack room, located on the northern side of the original building and conforming to it in its architecture, and fireproof, has accommodations for from eighty to ninety thousand volumes, and is a valuable addition to the efficiency of the library. This was the gift of Miss Marjorie Van Wickle, in January, 1911, when the library had grown to such proportions as to require additional storage room for its books.

The entire building, being well adapted to its uses, constitutes at once a most beautiful and useful feature in the development and equipment of the College.

Jenks Biological Hall.

This building was erected in 1864–'65 by the late Barton H. Jenks, of Philadelphia. It was recently entirely remodeled.

The Gayley Laboratory of Chemistry and Metallurgy

completed in 1902, is occupied by the departments of chemistry and metallurgy. The building consists of three stories, and is constructed of Indiana stone, colonial brick, and gray terra cotta. It is fireproof, with steel and cement floors, and gives a thoroughly modern equipment to these departments. This building contains also the Henry W. Oliver Chemical and Metallurgical Library.

THE ASTRONOMICAL OBSERVATORY,

in addition to the Observatory proper, contains a lecture-room, with accommodations for the students in astronomy.

WEST COLLEGE

contains the lecture room for two generations used by Prof. Francis A. March, the great scholar and beloved teacher and now occupied by Prof. Francis A. March, Jr., and the offices of the registrar and treasurer of the College.

GYMNASIUM.

The importance of physical culture was early recognized by this College and a gymnasium was erected in 1884 and placed under the direction of a competent instructor. At the present time regular drills are required of the Freshmen four times a week. Optional training in general gymnastics and fencing is offered to upperclassmen, and the students are encouraged to participate in such outdoor sports as their physical development fits them for.

The gymnasium is equipped with all the apparatus requisite to physical training, with lockers, bath and dressing-rooms. Before taking part in the gymnasium exercises, or the outdoor sports, every student is given a thorough examination, and great care is taken to give each student such exercises as he needs and to avoid anything that would be injurious. In addition to the Director, one of the most able and experienced physicians of Easton acts as consulting physician, and requests for special work or exception from any prescribed work are passed on by the Director and the Consulting Physician. No excuses from the required drills will be granted except upon the recommendations of these officials. A fine athletic field adjoins the campus. It is admirably equipped for athletic contests. Four recent classes erected a commodious field house on it. Here the contests in football, baseball, and track athletics, in which the students have excelled, are held.

No student may take part in any public contest without written permission from his parents previously filed with the Dean.

THE DORMITORIES.

A complete reorganization of the dormitory system was effected in the summer of 1900 by the building of central structures, known as Knox and Fayerweather Halls, to connect Blair and Newkirk Halls and Martien and Powell Halls, respectively, and the facing of the completed buildings with mottled Pompeian brick, handsomely trimmed with red terra cotta. The architectural beauty of the buildings is in marked contrast with the former appearance of the separate building. A complete sanitary plumbing system of baths, sinks, closets and electric lights has been installed in all the buildings. These improvements leave nothing to be desired for the health and comfort of the students.

FRATERNITY HOUSES.

Early in the current century the crowded condition of the dormitories made additional provision for rooms for the students imperative. To meet this need and to provide comfortable accommodations for their students, the fraternities represented in the College began the erection of a series of buildings, nearly all of which are situated on the College Grounds, which provide rooms and in most cases all of the conveniences of student life for the members of the various fraternities. There are now nine fraternity houses built upon a similar plan of providing accommodations for about eighteen students each. The buildings are a beautiful addition to the College equipment and are under the same supervision as the College Dormitories.

INFIRMARY.

A small building on McCartney Street immediately adjoining East College has been set apart for the use of students suffering from contagious diseases. This building has but rarely been called into service, but on several occasions has served to prevent the extension of contagion by the isolation of single cases of diphtheria and scarlet fever which have occurred. The building is intended exclusively for the use of students rooming in the college buildings. For non-contagious cases of a serious character, the excellent hospital of the city offers the best modern conditions of treatment.

BRAINERD HALL.

This building for the Y. M. C. A., the gift of J. Renwick Hogg, Esq., '78, of the Board of Trustees, was erected in 1902. It is a three-story gray stone building in the Tudor Gothic style. It contains a large room for the meetings of the society, and reading, writing, and committee rooms; also a trophy room of the athletic association, a room for the collection of curios from foreign missionary fields, and bowling-alleys in the basement.

Its object is to afford a home under active Christian influences for all forms of student life.

MECHANICAL LABORATORY AND SHOPS.

A building to contain the laboratories and shops of the Department of Mechanical Engineering is now completed.

This building is 102 feet by 185 feet, of steel and concrete construction, and contains, on the main floor, a wood-working shop 45 feet by 75 feet, a machine shop of the same dimensions, and a laboratory 45 feet by 150 feet, for steam and gas engineering. In the rear a forge shop and foundry 40 feet by 45 feet each, also boiler and storage rooms, lockers and lavatories.

This building is a part of a proposed plan of a complete set of engineering buildings to furnish better facilities to carry on the work of the four departments of engineering.

CENTRAL STEAM PLANT.

During the autumn of 1909 a central steam plant was established with a power house built of stone with a concrete roof containing large boiler and storage rooms with every convenience for the running of the plant. The power house is equipped with four 150-horse-power boilers which are sufficient for the present need of the College and any probable additions for a considerable number of years to come. Provision is also made for the addition of an electric power plant whenever it shall be deemed desirable. This plant is now in full and successful operation and promises to be a great value to the College.

OTHER BUILDINGS.

The remaining buildings consist of a large GREENHOUSE, a useful adjunct to the department of botany, and also supplying flowers and plants for the adornment of the grounds in summer and of the buildings on public occasions. Besides these, a number of buildings are occupied as the HOMES OF THE MEMBERS OF THE FACULTY. The intimate relations resulting from the residence of both faculty and students upon the College grounds are regarded as one of the most wholesome features of the College life.

LIBRARIES AND READING-ROOM.

The College Library is located in the Van Wickle Memorial Library Building, previously described. It was established at the foundation of the College in 1832 and has had a steady growth since. It is largely made up of books bearing directly on the courses of instruction. It contains a large and valuable collection of the publications of the Early English Text Society, presented by the Class of 1871 which has established a fund for the purchase of these as issued.

It also contains a fine collection of books of earlier English literature, given by the Class of 1875 at its reunion in 1905, in honor of the late Prof. Francis A. March. Also a collection of over three hundred volumes in American literature, given by the Class of 1892 which established a fund for this and additions to it at its decennial reunion in 1902. Also a collection of books and pamphlets written by the students, faculty, alumni and trustees of the College, called "The Lafayette Library" and representing the literary activities of Lafayette men. This unique and valuable collection now numbers about six hundred volumes and includes almost a full set of the College catalogues, Commencement addresses and official publications.

The Reading-Room is supplied with a large and well selected line of papers and periodicals, general and technical, in different languages. It also contains a papyrus scroll, five feet long, from a mummy case at Thebes, with a hieratic inscription in the characters of 1050 B.C.—pronounced by Seyffarth the finest he had seen—presented by the late Hon. John W. Garrett, of the Class of 1837; also a full length portrait of Lafayette, by Healey, presented by the late Dr. Thomas W. Evans; also a large collection of portrait prints and medals of Lafayette, presented by the late President William C. Cattell, D.D., LL.D.

In the Van Wickle Memorial Library Building will be found the Ward Library also, the gift of the heirs of C. L. Ward, Esq., of Towanda, Pa., which is largely made up of books of history and political science.

The Henry W. Oliver Chemical and Metallurgical Library, founded by the gift of $5000 by Henry W. Oliver, of Pittsburgh, Pa., and enlarged by gifts from Prof. Edward Hart and others, and containing the College collection of chemical books, is located in the Gayley Chemical and Metallurgical Building. This library recently received from a friend of the College all the pamphlets, about three thousand, belonging to the library of the late Prof. Johannes Wislicenus, of the University of Leipsic.

The literary societies of the College have in their Halls libraries numbering about six thousand volumes, largely of a literary character, valuably supplementing the other libraries.

Gifts, which are hereby gratefully acknowledged, have been received by the libraries from the following individuals and institutions:

Individuals:

Everard Bierer; J. E. Boethius (4); Giles B. Bosworth; James W. Bright; Selden J. Coffin; Family of Frank J. Firth (2); Miss Anna W. Fox; Edward Hart (14); Clay W. Holmes (4); J. S. Illick; Charles S. Lerch (2); Horace Wilmer Marsh (4); J. M. Mecklin; Robert Hamill Nassau (3); Hon. George T. Oliver; Dr. Isaac Ott; Dr. Frank Overton (pamphlet); William B. Owen (27); Joseph F. Randolph; Allan Roberts (2); Herman Simon (20); Edgar F. Smith; Estate of Rev. Thomas Smythe, D.D. (10); Rev. Augustus H. Strong, D.D.; Earl G. Swem; Rev. D. J. Waller; E. D. Warfield (5); Ethan A. Weaver (7); Andrew D. White; Hill P. Wilson; Mrs. J. H. Woods.

Firms and Institutions:

American Institute of Christian Philosophy; American Society of Civil Engineers; American Telephone and Telegraph Co. (3); P. P. Caproni & Bro.; Carnegie Endowment for International Peace (5); Class of 1870, Yale University; Connecticut State Library; Massachusetts State Board of Health; New Jersey State Library; New York State Educational Department; Old Colony Trust Co.; Pennsylvania State College; University of Illinois; Yellow Pine Manufacturing Association.

Canadian Departments:

Department of the Interior; Royal Society of Canada.

United States Departments:

Smithsonian Institution (3); U. S. Superintendent of Documents (15).

The class of 1871 has given to the College a fund, the proceeds of which are to be used for the purchase of the publications of the Early English Text Society. The library now contains a large and valuable collection of these.

The class of 1875 at its reunion in 1905 by the gift of one thousand dollars established an alcove in the library to be known as "The Francis A. March Alcove."

The class of 1892 at its decennial reunion in 1902 established an alcove in the library devoted to American literature. Two hundred volumes have been purchased and additions will be made from time to time.

SCIENTIFIC COLLECTIONS.

These are extensive and valuable, and are rapidly increasing from year to year by gifts from societies and individual donors, and by special appropriations in addition to the fees for registration and matriculation.

Among the most valuable of the collections may be mentioned the extensive herbarium, collected by Prof. Thomas C. Porter during forty years of enthusiastic labor; it is especially rich in North American plants and is believed to contain the most complete flora of Pennsylvania in existence and the series of Ward's celebrated casts, illustrating geology and palaeontology.

The apparatus in the department of physics and applied mechanics, the instruments used in the departments of astronomy and engineering, and the scientific equipment of the numerous and extensive laboratories meet the demands of advanced instruction in these departments; a special feature, however, is the series of nine hundred wall charts, executed at the College by Gustave Garnier, under the direction of the professors in the departments of astronomy, chemistry, physics and applied mechanics, metallurgy, and natural history. There are valuable models in machine drawing, stone cutting, crystallography, and architecture.

COLLEGE SOCIETIES.

LITERARY SOCIETIES.

The *Washington* and *Franklin* societies were organized early in the history of the College and are conducted by the undergraduates. Both societies have well-furnished apartments in Pardee Hall, and valuable libraries. They meet every Wednesday evening for literary exercises, consisting of orations, essays, and debates. A generous rivalry for College honors exists between them, and each year representatives of the two societies from the Junior class engage in a public contest in oratory. On the day before Commencement the societies hold reunion meetings in their halls. These societies are an important part in College life and work, and *all the students are strongly advised to join them.*

BRAINERD EVANGELICAL SOCIETY.

The *Brainerd Evangelical Society*, as a society of inquiry, meets each Thursday evening and on the first Friday of each month in the interest of missions, and for the promotion of Christian effort. Its public anniversary is held on Sabbath evening of Commencement week, at which time a sermon is preached usually by some former member of the Society. In 1914 the preacher was Rev. John R. Davies, D.D., '81, Philadelphia.

BIOLOGICAL SOCIETY.

The *Biological Society* is for the purpose of making its members intelligent concerning the important biological questions of the day, enabling them to appreciate the value of research in nature. The membership consists of those students of the three upper classes who are either prospective or present members of the classes in biology, and of such graduate students as are interested in the laws of life comprehended through the natural history sciences.

Chemical Club.

A *Chemical Club* has been organized by the students, for reading and discussing papers contained in the current chemical magazines, and to listen to lectures from visiting chemists.

Deutscher Verein.

The *Deutscher Verein*, which is open to all students who are interested in German life, language and literature, meets at frequent intervals for lectures, singing, discussions, social intercourse and practice in speaking German. A dramatic entertainment in the German language is given during the year.

Classical Union.

The *Classical Union* is an association which aims to bring together the students of the culture courses and to promote the interests of classical study in the College. Lectures on important subjects are given from time to time by members of the faculty and by eminent scholars from other institutions.

Electrical Engineering Society.

A Branch of the American Institute of Electrical Engineers has been organized by the students in the

Department of Electrical Engineering. Meetings are held weekly. Papers are written, abstracts prepared and discussions held over important engineering projects or developments.

EXPENSES.

The tuition is $100 in the Classical, Latin Scientific and General Scientific Courses and $150 in the Engineering and Chemical Courses. In addition to the above there are the following fixed charges:

General Expenses	$24.00
Library and Reading Room	15.00
Gymnasium	6.00

(A full estimate of expenses including room-rent, board, etc., is given on page 180.)

Students pursuing courses of study identical with the technical courses though not candidates for technical degrees and those pursuing certain special courses of study will be charged the tuition of the technical courses $150 per year.

In addition to the above fees the following special fees are charged:

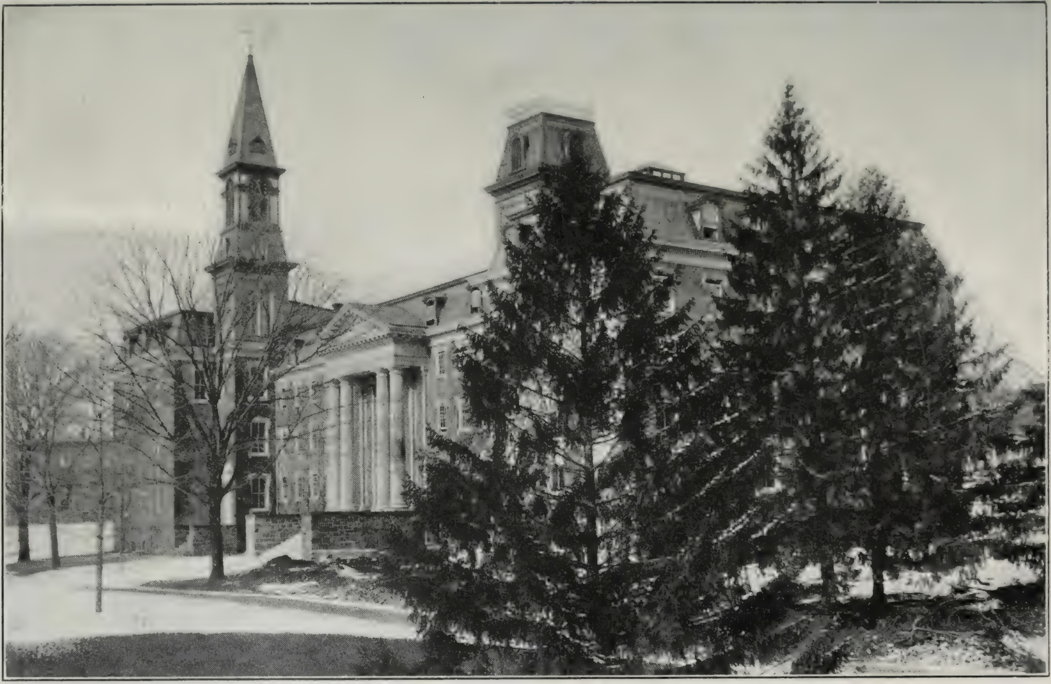
Entrance Fees.—Each student pays $5 when he is registered for examination on entering College, and $10 when he is matriculated, thirty days afterwards. These fees are appropriated in part to the increase of the scientific collections and apparatus. No fees are charged for diplomas.

Laboratories and Fees.—A fee is charged in each of the laboratories to meet the expenses incident to the work of the student. In the chemical laboratories the fee is based on the apparatus used and the chemicals consumed. In other laboratories a flat rate is charged based upon the average cost. These fees are payable at the beginning of the term.

A deposit of $1 is also made at the beginning of each term to pay for public damages, the unexpended balance of which is returned to the student at the end of the year.

Scholarships.—Aid is given to young men of ability, industry and character who are properly recommended to the College authorities. It is the object of all scholarships granted under this head to aid worthy young men and to attract especially desirable students to the College. Special consideration has always been given to the sons of ministers and of teachers, and to candidates for the Christian ministry. The aim, however, has not been to create a favored class but to recognize the generous support which the College has received and peculiar advantages which young men of unusual early training bring to the College. The amount of aid will depend upon the necessities of the applicant but in no case will exceed the amount of the tuition fees. No aid is granted to students pursuing special or incomplete course of study or to those who are not fully prepared to take advantage of the opportunities offered by the College.

Students who receive aid are required to maintain an average in scholarship equal to the average of their respective classes and in case of failure in any subject to remove the condition before the expiration of thirty days from the beginning of the next term. Scholarships which are granted at the beginning of the Freshman Year will be renewed annually subject to the general rules, but no scholarship which is lost on account of a failure



SOUTH COLLEGE.

to maintain the standard required will be renewed except at the beginning of a college year.

Applications for aid should be made to the President as early as possible after the first of January of the year in which the student expects to enter.

Scholarships offered as prizes in certain schools will be under the same regulations as other aid. The endowed scholarships issued to individuals prior to the establishment of the Scientific Department will provide free tuition in the Classical or Latin Scientific Courses and one-half tuition in the Technical Courses.

Board, Rooms, Washing.

In all cases the place of boarding must be approved by the Faculty. The price of table board in clubs managed by the students at present averages from $4.00 to $5.00 per week. Board, including furnished room, in private families, is from $4.50 to $6 per week. Washing costs 40 cents per dozen pieces.

Unfurnished rooms in the College buildings rent for $8 to $33 a term, unfurnished rooms adjacent to the College premises for $12 to $16 a term or furnished rooms for $15 to $30 a term.

The steam-heated dormitories are lighted by electricity, the cost of which to each of the occupants is $9 a year. The charge for heating is $12 a year for each occupant.

Students are expected to room in the College dormitories unless they receive permission to room elsewhere. If they do not occupy College rooms, they are subject to an assessment to meet the loss to the College for rooms left vacant. The reason for this is that the funds of the College have been invested in the dormitories in order to secure cheap and convenient lodgings for the students, and it is to the advantage of all that the buildings should be occupied, the income from the investment being essential to the work of the College, and the students being protected against exorbitant rents.

Information in regard to the selection of rooms can be had from Professor William T. Lyle, Inspector of College buildings, the buildings being open for inspection during each term, and three days preceding the first day of each term. Rooms are assigned only to students who have been admitted to College, or who present full certificates from authorized schools, in the order of their application.

College Bills.—College bills must be paid in advance. No student is enrolled for any term until his bill is paid and a student may be dropped from the roll of the Faculty at any time upon notice from the Treasurer that his college bill is overdue and unpaid. It is the duty of every student to present himself at the office of the Treasurer at the opening of each term, see that his bill is correct and pay it. Those who wish their bills sent home may have them sent to their parent or guardian if prompt request is made after their bills have been examined and found correct. No bills will be sent home upon a general request, and any neglect of early attention to a college bill will forfeit the right to any extension that would otherwise be granted.

For the convenience of the students it is arranged that payments of the bills shall be made by the Seniors on the first Thursday of each term, by the Juniors on the first Friday, by the Sophomores on the first Saturday, and by the Freshmen on the first Monday. No student is regarded as regularly enrolled for any term until his bill is paid. He may be dropped from the roll for neglect of his bill at any time upon notice from the Treasurer to the faculty. Where it is impossible for a student to pay his bill when due, the Executive Committee has power to extend the payment for a period of not more than thirty days from the beginning of the term. Such extension will only be granted upon written request filed with the Treasurer within ten days after the beginning of each term, giving a satisfactory reason for the extension asked for. A penalty of ten per cent. will be added to every bill remaining unpaid after the expiration of thirty days. No student, whose bill is unpaid, shall be permitted to take the term examinations.

Students entering after the middle of the term shall pay one-half of the College charges for the term. Students obliged, on account of sickness, to leave before the middle of the term may have refunded to them one-half of the College charges for the term; no reduction will be made to those leaving for any other cause.

Annual Expenses.—Some money for books and other incidental expenses will be needed, but, with close economy, the total annual expenses—exclusive of clothing, traveling expenses and laboratory fees—need not exceed $400, as will be seen from the following summary:

	Liberal.	Moderate.	Minimum.
General college expenses	$ 24.00	$ 24.00	$ 24.00
Charge for College reading-rooms, gymnasium, etc	21.00	21.00	21.00
Board, 36 weeks, at $4.00 to $5.00	180.00	160.00	144.00
Rent of College-room, $24 to $99	99.00	49.00	24.00
Light and fuel	21.00	21.00	21.00
Washing	25.00	16.00	12.00
Books and stationery	48.00	40.00	32.00
	$418.00	$331.00	$278.00

Add tuition of $100 or $150 according to course of study.

Laboratory fees and damage assessments, which vary in amount, must also be added, while the personal expenses for clothing, etc., must be estimated according to individual experience. The first year will be made more expensive by the fees for registration and matriculation, and furnishings for room.

Parents and guardians at a distance may deposit funds with some member of the faculty, who will pay particular attention to the pecuniary concerns of the student, settling his bills, and transmitting an account of the expenditure, for which services he will charge a commission. It is strongly recommended that parents furnish their sons with little beyond what will meet their necessary expenses.

BEQUEST AND DEVISES.

Each state has special statutory regulations in regard to wills, and it is most important that all testamentary papers be signed, witnessed, and executed in all other respects according to the laws of the state in which the testator resides. In all cases, however, the name of the corporation must be accurately given, as in the following forms:

I give, devise, and bequeath to "Lafayette College," in Easton, Pennsylvania, its successors and assigns forever, the sum of ....dollars, to be invested by said corporation in good real estate security, and the interest accruing therefrom to be applied to the support of the Professors in said College.

I, give, devise, and bequeath a certain lot situated, etc., to "Lafayette College," in Easton, Pennsylvania, and to their successors and assigns forever, for the uses and purposes of said College, according to the provisions of its charter.

PRIZES.

The following prizes are offered annually:

THE FRANCIS A. MARCH PRIZE IN ENGLISH.

A prize of thirty dollars in books was given from 1862 to 1881 by the late Rev. William C. Fowler, LL.D., of Durham, Connecticut, and since 1881 has been continued by Henry A. Potter, M.S., class of '77, of New York, under the title of "The Francis A. March Prize," upon the following conditions:

"A committee of at least three shall be chosen by the faculty to determine which student of the Senior class has made the greatest proficiency in English philology.

"The decision of the committee is to be made after attending an examination in some English classic, conducted by the professor in English, and after reading essays written by the several members of the class, which shall contain a discussion of the language of some English classic."

The subject in 1915 will be the works of Kipling.

THE ASTRONOMICAL PRIZE.

A prize of thirty dollars in gold is awarded to the student making the greatest progress in the study of astronomy in the Senior year.

MATHEMATICAL PRIZE

Two prizes, of the value of twenty dollars each are offered to those students of the Sophomore class, who shall have exhibited during the first two years of the course the greatest proficiency in the study of Mathematics. In 1912 these prizes were given to students in the Technical departments and in 1913 they were awarded to students in the Classical, Latin Scientific and General Courses of the Scientific department, and hereafter they will be awarded in alternate years to students in the two Mathematical courses.

These prizes were founded, as was the Astronomical prize above mentioned, in 1867, by Professor Traill Green, M.D., LL.D.

THE LOUNSBURY PRIZE IN CHAUCER.

A prize, consisting of books is given to that student of the Sophomore class who shall present the best essay upon some one of the works of Chaucer. This prize was given in 1896 by Thomas R. Lounsbury, professor of English at Yale University, and will be continued by friends of the College as the Lounsbury prize in Chaucer.

THE EARLY ENGLISH TEXT SOCIETY'S PRIZE.

A prize, consisting of books of the Early English Text Society, of London, is given to that student of the Sophomore class who shall, at the close of the Sophomore year, pass the best examination in "English before Chaucer." The examination is based upon selected texts announced from year to year, which in 1915 will be from the New Testament.

This prize was founded in 1871.

THE CLASS OF '83 PRIZE.

A prize of the value of fifteen dollars is annually awarded to that member of the Sophomore class who shall have attained the highest standing in his division of the class in Trench on the Study of Words.

This prize was founded by the class of 1883 at their graduation.

COLEMAN BIBLICAL PRIZE.

Prizes, each of the value of ten dollars, are awarded to those students of the Freshman class who have attained the highest standing in the several divisions of Biblical study in that year.

These prizes were founded by the Rev. Lyman Coleman, D.D., in 1880.

PRIZES IN ORATORY.

The Washington and Franklin literary societies appropriate one hundred dollars a year for prizes in oratory. Four contestants are chosen from each Hall to take part in the Junior Oratorical Contest, which is held in May. In the presence of a public audience three judges, approved by the faculty, hear the speakers and award the prizes. Their decision is based on the merit of the performances as to originality and force, with reference both to composition and delivery. The first prize is fifty dollars, the second prize thirty dollars, and the third prize twenty dollars.

CIVIL ENGINEEERING PRIZE.

A prize of the value of fifty dollars, the gift of Carrol Phillips Bassett, C.E., Ph.D., of the class of 1883, is annually awarded to that member of the graduating class who presents the best graduating thesis and attains the highest standard of scholarship in the Civil Engineering Course.

THE PARK PRIZE IN LATIN.

A prize of fifteen dollars for the Latin Department has recently been founded by Mr. Samuel R. Park, A.M., '84. In 1915 it will be awarded ,on the work of the second and third terms Freshman class, for excellence in Horace.

HISTORICAL ESSAY PRIZE.

A prize consisting of a copy of his work, "*The Marquis de Lafayette in the American Revolution*," is given annually by Charlemagne Tower, Jr., LL.D., of Philadelphia, to that member of the Senior class who shall, on or before the first day of October, present the best essay on some subject connected with the relations of *France and the United States*. The essay must not exceed three thousand words in length. The subject for the year 1915 is: "*The value of the French Alliance in the American Revolution*."

THE CHEMICAL ESSAY PRIZE.

A prize of five dollars in books is awarded each term to that member of the Junior or Senior class who shall present the best term theme on some chemical subject.

THE GILBERT PRIZE IN OLD ENGLISH.

By the will of Howard Worcester Gilbert, who died in Chester County, March 5, 1895, a bequest was left to the College, with the provision that a gold medal of the value of forty dollars should be awarded every two years to the student writing the best essay on the Old English Language and Literature, beginning with Beowulf, in the earliest Anglo-Saxon period, and extending down to the year 1070. Should the competitors be of equal merit, preference is to be given to residents of Pennsylvania.

The medal is an inch and three-fourths broad, three-sixteenths of an inch thick, and contains on its face a relief portrait of King Alfred with the date 871–901, surmounted by the Anglo-Saxon phrase, "Naes he gold hwaete." The reverse shows a garland encircled with the legend, "Howard Worcester Gilbert Old English Prize. Founded 1895." Space is left for the name of the recipient.

This prize will be awarded at the Commencement of 1915. It is open to competition of students of Anglo-Saxon in the graduate course of 1914–15. The essay must be handed in by May 1, 1915.

'85 PRIZE IN PHYSICS.

The class of 1885 founded a prize in 1897 in the sum of $500, the annual income of which is given to that member of the Junior class who attains the highest rank in the studies of physics.

THE BLOOMBERGH PRIZE.

The class of 1888, at its decennial reunion, subscribed the sum of $500, the annual income of which is awarded to that member of the Junior class who shall attain the greatest proficiency in the study of the French and German languages and their literatures.

THE JAMES ALEXANDER PETRIE PRIZE.

A prize of the annual value of $50 has been put at the disposal of the College as a memorial to the late James Alexander Petrie, M.D., of Phillipsburg, New Jersey. It will be awarded to that member of the Junior class who shall attain the greatest proficiency in the Department of Romance Languages.

THE B. F. BARGE GOLD MEDAL.

A prize of a gold medal of the value of $100 was founded by Benjamin F. Barge, Esq., of Mauch Chunk, Pa., to be awarded to that member of the Senior class who shall deliver the best oration in an annual contest to be held on Memorial Day, May 30th. The contestants, not more than six in number, are to be chosen by a committee of the faculty from those members of the Senior class, who shall hand in orations on or before May 1st upon topics assigned by the committee not later than March 25th of each year.

BARGE MATHEMATICAL PRIZES.

By the bequest of the late Benjamin F. Barge, Esq., of Mauch Chunk, three prizes of a total value of one hundred dollars have been established for excellence in mathematical studies. These prizes are awarded to members of the Sophomore class for excellence in the solution of original problems. In 1912 these prizes were given to students in the Classical, Latin Scientific and general courses of the Scientific department, and in 1913 they were awarded to students in the technical departments, and hereafter they will be awarded in alternate years to students in the two mathematical courses.

THE R. B. YOUNGMAN GREEK PRIZE.

The class of 1884, at its vigintennial reunion, subscribed the sum of $500, the income of which is to be awarded to that member of the Sophomore class who shall attain the greatest proficiency in Greek.

THE NEW SHAKESPEARE SOCIETY'S PRIZE.

A prize of books is awarded to that member of the Junior class who passes the best general examination upon Shakespeare, his works, life, character, etc.

NOTE.—In all cases where a prize is awarded to an essay or oration the successful competitor must hand to the proper authority two typewritten copies of his production before receiving the prize, if he is requested to do so.

DEGREES CONFERRED.

HONORARY DEGREES.

April 2, 1914.

Doctor of Laws.—Hon. Rudolph Blankenburg, Mayor of Philadelphia, Pa.

June 17, 1914.

Doctor of Divinity.—Rev. Charles Latta Chalfant, '89, Pastor of the First Presbyterian Church, Boise, Idaho; Rev. Frederick William Loetscher, Professor of Church History, Princeton Theological Seminary, Princeton, N. J.

Doctor of Science.—Frederick Passmore Gutelius, '87, Commissioner of Railroads, Dominion of Canada, Montreal, Canada; Eleanor Irene Burns, Professor of Physics, American College for Girls, Constantinople.

Doctor of Literature.—Herman LeRoy Collins, '87, Editorial Staff of *The Public Ledger*, Philadelphia, Pa.

October 28, 1914.

Doctor of Laws.—Hon. J. Hay Brown, Chief Justice of the Supreme Court of Pennsylvania, Lancaster, Pa.

Doctor of Divinity.—Rev. Charles Finley Sanders, Professor of Philosophy and Education, Pennsylvania College, Gettysburg, Pa.

Master of Science.—Frank Linton Patterson, Ex-'91, Brooklyn, N. Y.

DEGREES IN COURSE.

June 17, 1914.

Bachelor of Arts.—William Raymond Bender, Pa.; Earl Vincent Cline, Pa.; Solon John Fegeley, Pa.; Raymond Anthony Ketchledge, Pa.; Harold Samuel Laird, Pa.; James Anderson Mason, N. J.; Fred Nathan Miller, Pa.; Russell Cline Miller, N. J.; William Clarence Pryce, Pa.; Frederick Hiram Spotts, Pa.

Bachelor of Philosophy.—Walter DeWitt Barker, N. J.; Edmund Hance Carhart, Jr., N. J.; Edward Granville Chesley, Mass.; John Wellington Cleaver, Pa.; Earl DuTot Gardner, Pa.; Milton Conrad Ham, N. Y.; William Albert Herr, Pa.; Horace Kratz

Hiestand, Pa.; William Rodney Holbert, Pa.; Robert Volk Keihner, N. J.; Clarence Albert Kresge, Pa.; Douglas Perkins Lawall, Pa.; LeRoy Gilbert Lugar, Pa.; Thomas Francis McDonald, Jr., Pa.; John William Mann, Pa.; William Augustave Moore, N. J.; Charles Conyngham Morgan, Pa.; David Paul, Ireland; Roger Prosser, Pa.; Robert Leon Rankin, N. J.; Frank Joseph Reiser, Pa.; Lewis Robbin, Pa.; Joseph Seitz Rodenbough, Pa.; Johnston Wilbur Roling, Pa.; Abraham Jacob Segal, Pa.; Burton Sturdevant Shupp, Pa.; Vincent Robinson Smith, Pa.; Ward Mahlon Snyder, Pa.; Carl Caskey Speidel, D. C.; Roger Lockwood Totten, N. J.; Thomas Wayne Trembath, Pa.; Earnest Charles Watson, Ohio; Andrew Young, N. J.

BACHELOR OF SCIENCE.—Joseph Watson Craft, Jr., Pa.; John Summerfield Green, Jr., Md.; John Roland Lounsberry, N. Y.; Robert Chesebrough McCorkle, N. Y.; John Lang Speer, Pa.

BACHELOR OF SCIENCE IN CHEMISTRY.—Theodore Williams Chandler, Pa.; James Walter Hollenbach, Pa.; Edward Dodd Mead, N. J.; Peter John Naher, Pa.; Chester Gordon Peck, N. J.; John Pfromm, Pa.

CIVIL ENGINEER.—Pierson Booth, N. Y.; Ralph Fitch Brown, Pa.; Kenneth Hendrick Colville, Pa.; Charles Walter Conde, N. J.; James Ray Conrad, Pa.; Spencer Danby, Pa.; John Munson Doremus, N. J.; William Edward Fitzgerald, N. J.; Frederick Conrad Gamsu, N. Y.; Harold Pauli Heil, Pa.; John Knight, N. J.; Benjamin Lewis, N, Y.; Francis Kinsey Metzgar, N. J.; James Thompson Reside, N. J.; James Hiatt Salmon, Pa.; Charles Abram Secor, N. J.; Frederick Josiah Spry, Pa,; William Grant Taggart, Pa.

MINING ENGINEER.—Stanley Howard Cline, N. J.; William Gould Gould, Pa.

ELECTRICAL ENGINEER.—Vergil Alvin Davison, Pa.; Gershom Porter Ellis, Pa.; Frederick Louis Kolb, Pa.; Russell Keller Laros, Pa.; John Wesley Magee, Pa.; Hobart Condit Mitchell, N. J.; John Morris Shimer, Pa.; Moses Hiles Simmons, N. J.

MECHANICAL ENGINEER.—Claude Mark Albert, Pa.; Gilbert

Lane Dannehower, Pa.; Allan Palmer Darlington, Pa.; John Carl Kielman, Ohio.

MASTER OF SCIENCE.—John Calwey, B.S. '10, Pa.; Henry Butts Huselton, B.S. '13, Pa.

October 28, 1914.

CIVIL ENGINEER.—David Burrell McWilliams, Pa.

ELECTRICAL ENGINEER.—John Riegel Clymer, Pa.; Walter Walton Thompson, Md.

MECHANICAL ENGINEER.—William Ward Frick, Pa.; William Wagenhurst, Pa.

MASTER OF ARTS.—Harold Dumont Beatty, A.B. '12, N. J.

COMMENCEMENT DISTINCTIONS, 1914.

HONORS.—William Raymond Bender, East Bangor; Theodore Williams Chandler, Scranton; Carl Caskey Speidel, Washington, D. C.; Frederick Hiram Spotts, Williamsport; Earnest Charles Watson, Columbus, Ohio.

ORATIONS.—Walter DeWitt Barker, Matawan, N. J.; John Wellington Cleaver, Danville; James Ray Conrad, Reading; William Albert Herr, Hazleton; James Walter Hollenbach, Reading; John Carl Kielman, Portsmouth, Ohio; Douglas Perkins Lawall, Easton; John Roland Lounsberry, Branchport, N. Y.; LeRoy Gilbert Lugar, Ashbourne; Edward Dodd Mead, Newark, N. J.; Fred Nathan Miller, Easton; Lewis Robbin, Steelton; Ward Mahlon Snyder, Easton; Thomas Wayne Trembath, Kingston; Andrew Young, Irvington, N. J.

PRIZES AWARDED.

SENIOR PRIZEMEN.

THE FRANCIS A. MARCH PHILOLOGICAL PRIZE: Earl D. Gardner, Easton.

THE ASTRONOMICAL PRIZE: Earnest C. Watson, Columbus, Ohio.

THE B. F. BARGE PRIZE IN ORATORY: Walter D. Barker, Matawan, N. J.

JUNIOR PRIZEMEN.

THE CLASS OF '85 PRIZE IN PHYSICS: William R. Amberson, Waynesboro.

THE BLOOMBERGH PRIZE IN MODERN LANGUAGES: Otto May, Pittsburgh.

THE JAMES ALEXANDER PETRIE PRIZE IN ROMANCE LANGUAGES: Divided between Wilbur A. Bryan, Hackettstown, N. J., and James J. Waygood, Oak Lane.

THE SHAKESPEARE PRIZE: Ralph F. Shaner, Pottstown.

THE JUNIOR ORATORICAL PRIZES:

FIRST: William R. Amberson, Waynesboro.
SECOND: Charles W. Horr, Newark, N. J.
THIRD: William H. Johnston, Philadelphia.

THE CHEMICAL ESSAY PRIZES: Arthur J. Lockard, Easton, and Harold W. Sloyer, Easton.

SOPHOMORE PRIZEMEN.

THE TRAILL GREEN MATHEMATICAL PRIZES:

FIRST: George N. Cohen, Washington, D. C.
SECOND: Frank H. Schlough, Easton.

THE LOUNSBURY PRIZE IN CHAUCER: Solomon Livingston, Dover, N. J.

THE EARLY ENGLISH TEXT SOCIETY'S PRIZE: Bernard S. Hoffenstein, Wilkes-Barre.

THE CLASS OF '83 PRIZE IN ENGLISH: James L. Trowbridge, Easton.

THE B. F. BARGE MATHEMATICAL PRIZES:

FIRST: Lloyd M. Felmly, Phillipsburg, N. J.
SECOND: William C. Mecray, Cape May City, N. J.
THIRD: Bernard S. Hoffenstein, Wilkes-Barre.

THE R. B. YOUNGMAN GREEK PRIZE: Ray D. Herring, Pen Argyl.

FRESHMAN PRIZES.

THE LYMAN COLEMAN BIBLICAL PRIZES:

DIVISION A: Kenneth M. Bixler, Easton.
DIVISION B: Benjamin G. Dann, Beltsville, Md.
DIVISION C: Harold R. Keeler, Harleysville.

Division D: Maxwell McKeen, Easton.

Division E: Warren K. Sherman, New Germantown, N. J.

Division F: Mortimer M. Stocker, Honesdale.

The Park Prize in Latin: Kenneth M. Bixler, Easton.

CLASS MONITORS.

Appointed for general excellence in study:

Senior Class: William R. Amberson.

Junior Class: Willard A. Pollard, Jr.

Sophomore Class: Benjamin G. Dann.

Freshman Class: Walter G. Kleinspehn and Jacob H. Ritter.

THESES PRESENTED BY CANDIDATE FOR DEGREES IN THE TECHNICAL COURSES OF THE PARDEE SCIENTIFIC DEPARTMENTS.

1. The Effect of Waterproofing Compounds upon the Properties of Cement and the Permeability of Concrete.
   Ralph Fitch Brown, Honesdale.
   Charles Walter Conde, High Bridge, N. J.

2. Electrolysis of Reinforced Concrete.
   Benjamin Lewis, New York, N. Y.
   James Hiatt Salmon, Clarks Green.

3. Design of a Water Supply System for College Hill, Easton, Pa.
   Frederick Josiah Spry, Kingston.

4. Investigation of the Behavior of Reinforced Concrete Beams by Means of the Berry Strain Gauge.
   Pierson Booth, Middletown, N. Y.
   James Ray Conrad, Reading.
   William Edward Fitzgerald, Trenton, N. J.
   William Grant Taggart, Fracksville.

5. Friction Between the Plates of Riveted Joints.
   Kenneth Hendrick Colville, Carbondale.

6. Design of a Through Pettit Truss Railroad Bridge.
   James Thompson Reside, Salem, N. J.

7. Design of a Sewer Disposal Plant for Easton, Pa.
   Spencer Danby, Easton.
   Harold Pauli Heil, Easton.

8. The Pedestal Concrete Pile.
   Charles Abram Secor, Arlington, N. J.

9. Holding Power of Railroad Spikes.
   John Munson Doremus, Gladstone, N. J.
   John Knight, Summit, N. J.

10. Calibration of Extensometers.
    Frederick Conrad Gamsu, Arverne, L. I., N. Y.
    Francis Kinsey Metzgar, Phillipsburg, N. J.

11. Cesium Alum and its Properties.
    Henry Butts Huselton, Easton.

12. The Production of Celestite to Strontium Sulfid.
    Edward Dodd Mead, Newark, N. J.

13. Preparation of Telluric Acid.
    From Tellurous Acid.
    Theodore Williams Chandler, Scranton.
    From Tellurium.
    John Pfromm, Hazleton.
    By Fusion Method.
    Chester Gordon Peck, Perth Amboy, N. J.
    By the Chromic Acid Method.
    James Walter Hollenbach, Reading.
    Peter John Naher, Scranton.

14. The Mining and Milling of the New Jersey Zinc Company, at Franklin Furnace, N. J.
    Stanley Howard Cline, Phillipsburg, N. J.
    William Gould Gould, Easton.

15. Test on an Alternating Current Synchronous Motor and Generator.
    VERGIL ALVIN DAVISON, Easton.
    GERSHOM PORTER ELLIS, Avoca.

16. Investigation of the Electrical and Mechanical Characteristics of a Double-Current Generator.
    FREDERICK LOUIS KOLB, Scranton.
    JOHN MORRIS SHIMER, Easton.

17. Electrolysis from Stray Electric Currents with Special Reference to a Complete Electrolytic Survey of the Telephone Conduit System in Easton, Pa.
    JOHN RIEGEL CLYMER, Riegelsville, Pa.
    RUSSELL KELLER LAROS, Easton.
    WALTER WALTON THOMPSON, Baltimore, Md.

18. Electricity in Slate Quarries.
    JOHN WESLEY MAGEE, Easton.

19. The Installation and Test of an Inter-Pole Generator.
    HOBART CONDIT MITCHELL, Newark, N. J.
    MOSES HILES SIMMONS, Hamburg, N. J.

20. Comparative Test of a Direct-Connected Gas and Electric Unit, Using Various Mixtures of Gasoline and Kerosene as Fuel.
    CLAUDE MARK ALBERT, Pen Argyl.
    JOHN CARL KIELMAN, Portsmouth, Ohio.

21. Thermal Conductivity of Steam Pipe Insulation.
    GILBERT LANE DANNEHOWER, Norristown.
    WILLIAM WAGENHURST, Norristown.

22. Comparative Tests of Three Kinds of High Speed Tool Steels.
    ALLAN PALMER DARLINGTON, West Chester.
    WILLIAM WARD FRICK, Pittsburgh.

THE ALUMNI ASSOCIATIONS.

The Alumni Association is composed of graduates of the College and such former students as left College before graduation, in good standing, as may be elected. The annual meeting is held on Tuesday, preceding Commencement Day.

The Association has the privilege of choosing, every alternate year, two members of the Board of Trustees, who hold office for six years. In June, 1914, Charles Heebner, '78, of Philadelphia, and J. George Becht, '90, of Harrisburg, were chosen. In the Spring of 1916 two more will be voted for.

The Executive Committee is as follows: McCluney Radcliffe M.D., '77, Chairman, Philadelphia; Robert F. Whitmer, '85, Philadelphia; Fred R. Drake, '86, Easton; James W. Fox, '88, Easton; J. M. Porter, '86, Easton; Thomas Fisher, '88, Philadelphia; George D. McIlvaine, '89, Pittsburgh; E. G. Smith, '94, Wilkes-Barre; George A. Sigman, '05, Philadelphia.

It is desirable to keep up the full record, so long maintained, of the residences, occupations, literary efforts, and public services of the alumni and former students of the College.

Information is solicited in regard to these points, and also in reference to matters appropriate to the obituary record, which is annually prepared for the alumni association.

Each alumnus is asked to send his personal record, carefully revised to date, to the Secretary before May 1, 1915.

LOCAL ASSOCIATIONS.

ALUMNI ASSOCIATION OF LAFAYETTE.

Rush N. Harry, '89, Cincinnati, Ohio	*President*
George W. W. Porter, '85, Newark, N. J.	*Vice-President*
Rev. J. F. Stonecipher, D.D., '74, Easton	*Sec. and Treasurer*

THE LAFAYETTE ALUMNI ASSOCIATION OF NORTH-EASTERN PENNSYLVANIA.

Ernest G. Smith, '94, Scranton	*President*
Oscar J. Harvey, '71, Wilkes-Barre	*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF PHILADELPHIA AND VICINITY.

SIMON CAMERON LONG, '77, Philadelphia.............*President*
CHARLES B. ADAMSON, '77, 222 Walnut St., Phila......*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF NEW YORK AND VICINITY.

JOHN W. GRIGGS, '68, Paterson, N. J..................*President*
DUDLEY E. LATHAM, '05, 165 Broadway, New York, N. Y..*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF THE WEST BRANCH.

FRED H. PAYNE, '88, Williamsport......................*President*
R. FLEMING ALLEN, '90, Williamsport.................*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF CENTRAL PENNSYLVANIA.

REV. A. N. HAGERTY, '81, Carlisle......................*President*
WILLIAM H. ERNEST, '97, 3rd and Market Sts., Harrisburg..*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF WESTERN PENNSYLVANIA.

CHAUNCEY LOBINGER, '96, Pittsburgh.................*President*
A. WILSON McCANDLESS, '06, Frick Bldg. Annex, Pittsburgh...................................*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF CHICAGO AND VICINITY.

NATHAN GRIER MOORE, '73, Chicago, Ill..............*President*
TRACY D. LUCCOCK, '05, 801 Manhattan Bl., Chicago, Ill..*Secretary*

THE LAFAYETTE ALUMNI ASSOCIATION OF WASHINGTON, BALTIMORE AND VICINITY.

WALTER B. GUY, '05, Washington, D. C.................*President*
ELI SWAVELY, '96, 4101 Connecticut Ave., Washington, D. C..*Secretary*

STUDENTS.

GRADUATE STUDENTS.

S. B. Gilhuly, A.M., N. J.	History and English Literature,	Lafayette, '86.
J. B. Hench, A.M., Pa.	Latin,	Lafayette, '83.
William H. Kirkpatrick, A.B., Pa.	History and Political Science,	Lafayette, '05.
Carmon Ross, Ph.B., Pa.	Modern Languages,	Lafayette, '05.
John Royden Hess, Ph.B., Pa.	Chemistry,	Lafayette, '07.
David W. Phillips, A.B., Pa.	English and Pedagogy,	Lafayette, '05.
Harold John Lockwood, E.E., Pa.	Physics,	Lafayette, '12.
Atcheson Laughlin Hench, A.B., Pa.	History and English,	Lafayette, '12.
Gilbert Nickel, A.B., Pa.	Latin and English,	Lafayette, '13.
Ziba Raymond Howell, Ph.B., N. Y.	Physics,	Lafayette, '07.
Charles Garfield Eichlin, A.B., Pa.	Physics,	Lafayette, '13.
James Hamill Boal, A.B., Pa.	History and Economics,	Lafayette, '02.
Frederick Hiram Spotts, A.B., Pa.	History and Mathematics	Lafayette, '14.
Thomas Francis McDonald, Ph.B., Pa.	Latin and French	Lafayette, '14.
Fred Nathan Miller, A.B., Pa.	Biology and Pedagogy	Lafayette, '14.
John Pfromm, B.S., in Chem., Pa.	Chemistry,	Lafayette, '14.

Graduates.. 16

SENIOR CLASS, 1915.

Name.	Course of Study.	Residence.	Room.
Stuart Welsh Adler	L	Yonkers, N. Y.	133 M.
William Ruthrauff Amberson	L	Waynesboro	71 B
Edgar Maurer Anderson, Jr.	C.E.	Jersey City, N. J.	Δ Υ
Harold William Anderson†	Ch.	Paterson, N. J.	91 McK.
William Ross Andre	L	Stroudsburg	43 S.
Andrew Gustave Bisset	C.E.	Washington, D. C.	Χ Φ
Charles Sherwood Boyce	C.E.	Binghamton, N. Y.	Φ Κ Ψ
Edwin Douglas Boyce	C.E.	Binghamton, N. Y.	Φ Κ Ψ
George Garwood Brown	G.S.	Lakewood, N. J.	134 M.
Wilbur Aaron Bryan	L	Hackettstown, N. J.	72 B.
Richard Griffith Burn	L	Oxford	150 P.
Paul Leo Clugston	L	Waynesboro	106 McK.
David Rhea Coffman	C	Scotland	35 S.
William Hazel Collins	E.M.	Washington, D. C.	Χ Φ
Kenneth Hendrick Colville	M.E.	Carbondale	Δ Τ Δ
Howard Strong Conklin, Jr.	E.E.	Patchogue, N. Y.	Δ Υ
Donald Otto Coughlin	L	Luzerne	Δ Τ Δ
Lester Marshall Curtiss	Ch.	Norfolk, Conn.	Σ Χ
Frederick King Davidson	Ch.	Boonton, N. J.	129 M.
Merrill Boswell Davis	L	Boonton, N. J.	Brd.
Dwight Moody Decker	Ch.	West Pittston	Δ Υ
Joseph Ignatius Diamond	G.S.	Cynwyd	Δ Υ
William Lukens Edwards	C.E.	Lansdale	81 N.
John James Egan, Jr.	L	Trenton, N. J.	Δ Τ Δ
Robert Edmonston Ellis	M.E.	Paterson, N. J.	85 N.
William Johnson English, Jr.	E.E.	Ocean Grove, N. J.	86 N.
Frank Arthur Ernst	C.E.	Hoboken, N. J.	Δ Υ
Charles Clark Evans	G.S.	Berwick	Φ Δ Θ
Henry Rudolph Finger	L	Wilkes-Barre	Σ Χ
Edgar Miller Furry	G.S.	Altoona	Χ Φ
Wilson Baughman Gaither	L	Greenburg	Δ Κ Ε
Dudley Able Giberson	L	Easton	246 Bushkill

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Martin Thomas Hagerty, Jr.	G.S.	Phillipsburg, N. J.,	Home Fairview Heights
Edgar Thomas Hammer	L.	Greensburg	Φ Δ Θ
Howard Hanks	C.E.	New York, N. Y	Χ Φ
Emory Wilbur Helfrich	G.S.	Pleasantville, N. J	Χ Φ
James Monroe Hess, Jr.	L.	East Mauch Chunk	Δ Τ Δ
Randall Francis Holden	C.E.	Washington, D. C	85 N.
Charles Wood Horr	L.	Newark, N. J	Θ Δ Χ
Alfred Lobb Jeffery	C.	Pen Argyl	99 McK.
Harold West Johnson	C.E.	Sparrowbush, N. Y	128 M.
William Harrison Johnston	C.	Philadelphia	35 S.
Harry Edward Jones	C.E.	Waterbury, Conn	39 S.
Alexander Weikel Jordan	E.M.	Easton	1055 Butler
William George Keat	M.E.	Pen Argyl	122 McK.
James Henry Kennedy	E.E.	Lansdowne	75 K.
John R. Kenyon	C.E.	Binghamton, N. Y	Φ Κ Ψ
Joseph Homet Kerrick	E.E.	Germantown	Χ Φ
Walton Barr Killough	E.E.	Elizabeth, N. J	50 S.
George Washington Krick	C.E.	Merion	Χ Φ
Nelson David Langenbach	Ch.	Easton	R. D. No. 2
Gordon Lee	L.	Carbondale	Δ Τ Δ
Paul Morley Lee	E.E.	Middletown, N. Y	78 K.
LeRoy Lefferson	E.E.	Manasquan, N. J	Ζ Ψ
Horace Algert Lehr	C.	Easton	Χ Φ
John Swivel Leister	C.E.	Reedsville	11 S.
Grover Cleveland Lesser	E.M.	Upper Lehigh	314 McC.
Arthur Jefferson Lockard	Ch.	Easton	102 Cattell
Charles Raymond Lohman	E.E.	Kingston	80 N.
Robert Dallas McManigal	E.E.	Logan, Ohio	80 N.
Warren Bryan Mack	L.	Flicksville	637 High
Walter Seeley Mallory, Jr.	Ch.	Easton	Θ Δ Χ
Edward John Fox Marx	L.	Easton	8 Chestnut Terrace
John Kennedy Maxwell	C.	Easton	612 Cattell
Otto May	L.	Pittsburgh	68 B.
William Cassedy Mecray	G.S.	Cape May City, N. J	61 B.
Arthur Leon Meyer	Ch.	Trenton, N. J	Φ Δ Θ
Carl Nicholas Miller, Jr.	Ch.	Bangor	75 K.

Name.	Course of Study.	Residence.	Room.
George Roland Miller, Jr	C	Easton	323 High
William McKee Moffat	C	Fort Wayne, Ind	78 K.
John Heiks Paul	M.E.	Mechanicsburg	86 N.
William Hunter Powell	E.E.	Wyncote	Ζ Ψ
Lewis Matten Prutzman	L	Hamburg	16 S.
Shipman Roseberry Pursel	C.E.	Phillipsburg, N. J.	Home R. D.
Barron Peard Rex	L	Rumson, N. J	148 P.
Jules Darius Roberts, Jr	M.E.	Dallas, Texas	76 K.
Roy Thomas Robling	C	Moosic	Brd.
Carl Fawcett Scharpf	L	Coraopolis	Δ Υ
Ralph Andrew Schilling	E.M.	Easton	208 No. 7th
Arthur Anders Schultz	Ch.	Norristown	134 M.
Walter James Scott	L	Collingswood, N. J.	99 McK.
Frank Jacob Seibert	Ch.	Easton	640 Wolf
Ralph Faust Shaner	L	Pottstown	36 S.
Harold William Sloyer	Ch.	Easton	R. D. No. 6
Ernest Elwin Smith	E.E.	Lehighton	81 N.
Foster Byron Snowden	L	Conemaugh	139 F.
Robert Smith Soles	E.E.	McKeesport	Φ Κ Ψ
Paul Virchow Speer	G.S.	Vandergrift	Χ Φ
William Joel Spry	L	Plymouth	122 McK.
Millard Fillmore Staples	C	Stroudsburg	Χ Φ
Benjamin Cornell Stevens	L	Wyalusing	44 S.
Frank Marshall Sweeny	C.E.	Baltimore, Md	89 N.
William Perry Tallman	L	Phillipsburg, N. J.	Home 35 Bullman
Lewis Grant Teetsell	Ch.	Tarrytown, N. Y	Δ Υ
James Donohoe Toole	L	Minersville	88 N.
Lyman Charac VanInwegen	E.E.	Huguenot, N. Y	128 M.
George Willever Walton	L	Berwick	36 S.
James Jamison Waygood	L	Glenside	Φ Δ Θ
Cornelius Lane Wells	G.S.	Wayne	Ζ Ψ
Lea Danenhower Williams	G.S.	Washington, D. C	Χ Φ
Russell Stanley Woglom	L	Perth Amboy, N. J	49 S.
Gilbert Allan Woods	Ch.	Easton	Chestnut and Cattell
Willard Wright†	L	Worcester, N. Y	48 McC.

SENIORS 103

JUNIOR CLASS, 1916.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
John Quincy Adams	C.E.	Easton	819 Spring Garden
George Lenher Alexander	Ch.	Everett	66 B.
Karl Janeway Ammerman	M.E.	Scranton	Δ Υ
Ross Quay Augustine	L.	Uniontown	Θ Δ Χ
Harold Wilbur Bailey	E.E.	Milburn, N. J.	130 McC
John Watts Baer Bausman, Jr	G.S.	Lancaster	Δ Κ Ε
Joseph Shakespeare Beddall	Ch.	Tamaqua	Σ Χ
Harvey MacKnight Black	C.	Easton	129 Pierce
Daniel McMichael Blackburn	M.E.	Easton	807 Wood
Earl Andrew Brinker	Ch.	Easton	415 High
Clarence Jenkins Brown	L.	Lakewood, N. J.	144 P.
Hugh Jackson Bubb	G.S.	Williamsport	Δ Κ Ε
Richard Anderson Burk	C.E.	Toronto, Ont.	——
Richard Cameron Cain	Ch.	Berwick	Δ Τ Δ
Thomas Derby Carey	L.	Moosic	72 B.
Harold Frederick Carter	G.S.	Norfolk, Ct.	27 S.
Charles Samuel Clark	C.E.	Binghamton, N. Y.	Φ Κ Ψ
Robert Nesbitt Clark	L.	Wilkes-Barre	97 McK.
*C. Marshall Cochran	Ch.	West Chester	——
George Nathaniel Cohen	C.E.	Washington, D. C.	522 New
Floyd Hoff Compton	M.E.	Springtown, N. J.	Home
William Mead Cornwell	E.E.	Blairstown, N. J.	——
Carl McMaster Crawford	C.	Indiana	——
William Eugene Delaney, Jr.	L.	Williamsport	Χ Φ
John Patrick Diamond	C.E.	Cynwyd	——
Theodore Mulford Doan	G.S.	Berwick	138 F.
Colin Tolmie Dodd	G.S.	Phillipsburg, N. J.,	Home, 32 Chambers
John Earle Donmoyer	G.S.	Lebanon	Δ Υ
Sydney Fetherman Downs	M.E.	Easton	118 Parsons
Frederick Drexel	C.E.	Brooklyn, N. Y.	137 F.

*Died November 21, 1914

Name.	Course of Study.	Residence.	Room.
Alfred Hall Drummond	E.E.	Nanking, China	67 B.
John Hannaniah Dyer	L.	Scranton	97 McK.
Lloyd McPherson Felmly	L.	Phillipsburg, N. J., Home,	5 Front
Harold Davies Fernau	L.	Jeddo	Δ T Δ
Ralph Sprague Ford	L.	Richmond, Ohio	130 M.
Clarence Welch Forshee	G.S.	Glenwood, N. J	Φ Δ Θ
Harry LaTourette Foster	L.	Brooklyn, N. Y	88 N.
Louis Rodman Fox	E.E.	Easton	Z Ψ
Sylvio de Campos Freire	C.E.	Sao Paulo, Brazil	611 High
Russell Harrison Fritz	M.E.	High Bridge, N. J	65 B.
John Henry Gaffin	C.E.	Wyoming, N. Y	136 McC
James Russell Gardner	C.E.	Scranton	Δ Υ
William Joseph Gaynor	L.	Phillipsburg, N. J., Home,	76 Fayette
Frederick Augustus Glisencamp	L.	Mount Tabor, N. J	33 S.
Harman Reasoner Goldthwaite	G.S.	Marion, Ind	Z Ψ
Walter Berton Grigsby	C.E.	Washington, D. C.,	102 McK.
Joachim Isaac Gulick	L.	White House Station, N. J.,	———
Frank Sharp Hammond	M.E.	Coatesville	76 K.
Herbert Newlin Hartman	L.	Wilmington, Del	Brd.
Francis Ogden Hathaway	L.	Deposit, N. Y	63 B.
Philip Showalter Hench	C.	Pittsburgh	142 P.
Ray DeWitt Herring	C.	Pen Argyl	33 S.
Christian Aaron Hess	Ch.	Stroudsburg	Knox St.
Bernard Sol. Hoffenstein	L.	Wilkes-Barre	711 High
Paul Hacke Hugus	L.	Latrobe	Φ Κ Ψ
Frederick Blackburn Hunt	E.E.	Trenton, N. J	37 S.
John Rexroth Irwin	L.	McConnellsburg	64 B.
Homer Miller Jacobs	L.	Pottstown	34 S.
Sedgwick Kistler Johnson	Ch.	Easton	114 McK.
Harry Melick Keller	Ch.	Stroudsburg	83 N.
Frank Boone Kelly	E.E.	Pitman, N. J	———
Elmer Walton Kirk, Jr	C.E.	Doylestown	———
William Irwin Kocher	L.	Easton	R. D. No. 2

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Russell Stewart Kramer	E.E.	Easton	724 Coleman
Kenneth Wolfinger Kressler	L.	Easton	13th and Butler
John Raymond Kuechel	C.E.	Elizabeth, N. J.	150 P.
Paul Angier Laird	Ch.	West Chester	Prof. Youngman's
Claude Brinser Lerch	L.	Highspire	———
Bennett Moorhead Livezey	Ch.	Doylestown	Φ K Ψ
Jacob Livingston	G.S.	Dover, N. J.	84 N.
Solomon Livingston	G.S.	Dover, N. J.	84 N.
Richard Bennett Lloyd	C.E.	Washington, D. C.	X Φ
Richard Whitney Logan	M.E.	Scranton	Φ K Ψ
Robert Lee Logan	L.	Philadelphia	40 S.
John Frederick Luhr	M.E.	Roselle Park, N. J.	Δ K E
Lawrence Thomas McCormick	C.E.	Belmar, N. J.	121 McK.
John William McDonald	C.	Boston, Mass.	Δ K E
Francis Andrew March	C.E.	Harrisburg	Δ K E
William Leo Matthes	M.E.	Phillipsburg, N. J.,	Home, 99 Sitgreaves
Kenneth Alston Maxwell	L.	Meadowbrook, N. Y.,	101 McK.
Norman William Miller	Ch.	Washington, D. C.	102 McK.
Gerald Amos Morgan	C.E.	Harrisburg	Φ Δ Θ
Leon Newpher Morgan	C.E.	Harrisburg	Φ Δ Θ
Harold Mumma	E.E.	Steelton	Φ Δ Θ
Frank Maurice Murphy	L.	Greensburg	34 S.
Milton Kendall Myers	Ch.	Washington, D. C.	87 N.
Harry Campbell Neely	C.	Woodbine	136 McC.
James Hance Neighbour, Jr.	C.E.	Dover, N. J.	Φ K Ψ
Harold Herman Offutt	Ch.	Washington, D. C.	709 High
John Secrist Oller	L.	Waynesboro	101 McK.
Norman Kethlege Pearson	C.E.	Flicksville	Home
Daniel James Perry	E.E.	Easton	137 So. 13th
Elbert B. Pickell	Ch.	Whitehouse, N. J.	163 E.
Edward Arthur Pitcher	C.E.	Dover, N. J.	Φ K Ψ
Willard Averell Pollard, Jr.	C.E.	Washington, D. C.	147 P.

Name.	Course of Study.	Residence.	Room.
Thomas Bancroft Reifsnyder	L.	East Orange, N. J.	50 S.
William Franklin Remaly	C.E.	Easton	409 High
Chauncey Hoffman Ribble	E.E.	Washington, N. J.	129 M.
George James Richards	C.E.	Wilkes-Barre	40 S.
Ross Wadsworth Rohn	L.	Sussex, N. J.	169 E.
Herbert Knapp Rollins	E.M.	New York, N. Y.	Δ Τ Δ
Frank Huff Schlough	E.E.	Easton	109 Orchard
Fred Calvin Shotwell	L.	Phillipsburg, N. J.,	Gramana
Monroe Wilson Sloyer	L.	Easton	R. D. No. 2
Earl Russell Smith	E.E.	Easton	1091 Berwick
Henry Jacob Smith	L.	New Oxford	16 S.
Lewis Aaron Smith	C.	Easton	R. D. No. 2
Harold Van Allen Stewart	Ch.	Quakake	223 McC.
Samuel Biffert Stilwell	L.	Doylestown	62 B.
John Norwood Stipe	L.	Easton	13th and Bushkill
Leon Stansfield Stone	L.	Newton, N. J.	151 P.
Russell Bennett Stone	L.	Easton	476 Nesquehoning
Guy Holden Stoutenburgh	G.S.	Far Hills, N. J.	Φ Κ Ψ
Charles Xavier Thomas	G.S.	Freeland	137 F.
Henry Huston Thomas	L.	Franklin	15 S.
Oscar Saul Tischler	L.	Wilkes-Barre	6 S.
Henry Moffett Tonkin	E.M.	Millington, Md.	83 N.
Philip Gerald Tormay	G.S.	Middletown, Ct.	709 High
James Lilly Trowbridge	C.	Easton	301 Cattell
George Brinton McClellan Troxell	Ch.	Easton.	Charles and Madison
Richard Britton Unangst	Ch.	Wilkes-Barre	230 McC.
Charles Reinhart Wackenhuth	L.	Picture Rocks	91 McK.
Frank Frederick Weaver	Ch.	Easton	18th and Butler
Edward Welles, Jr.	G.S.	Wilkes-Barre	28 S.
Charles Stevenson Wheeler	L.	Newville	62 B.
Thomas Arthur Williams	L.	Fullerton	130 M.
Joseph Gilliard Williamson	Ch.	Bloomsbury, N. J.	Home
William Henry Wilson	C.E.	Perth Amboy, N. J.	611 High
Edwin Willard Woehling	C.E.	East Orange, N. J.	65 B
William Irwin Woodcock, Jr.	L.	Hollidaysburg	Φ Κ Ψ

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Clark Ellis Woodring	E.E.	Hazleton	1327 Washington
Archie Scott Woods	M.E.	Easton	Chestnut and Cattell
Harold John Woodward	E.E.	Cookstown, N. J	Χ Φ
Lewis Benjamin Wyckoff	C.E.	Asbury Park, N. J.,	136 McC.
Russell Holcombe Wyckoff	C.E.	Flemington, N. J	Δ Τ Δ
James Simpson Young	L.	Wood Ridge, N. J	100 McK.

JUNIORS..136

SOPHOMORE CLASS, 1917.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Walter Decoursey Addis	G.S.	Oak Lane	637 High
David Bowman Adler	L.	Yonkers, N. Y.	146 P.
Eugene Henry Albright	G.S.	Mifflinburg	232 McC.
Jay Warren Angle, Jr.	L.	Hot Springs, Ark.	Δ Υ
Irving LaFétra Arbeely	C.	Oakton or Vienna, Va., R. F. D.	144 P.
Miers Seler Backenstoe	L.	Emaus	———
Robert Earle Bacon	L.	Bridgeton, N. J.	Δ Υ
Edwin Rockerfeller Baldrige	E.E.	Hollidaysburg	Z Ψ
Irenaeus Prime Bartley	M.E.	Bartley, N. J.	Z Ψ
William Clair Behney	L.	Lebanon	Φ Δ Θ
Joseph Ellsworth Beideman†	G.S.	Norristown	107 McK.
William Stanley Bell	C.E.	Cranford, N. J.	512 High
Frederick William Biltz	C.E.	Ashland	82 N.
Kenneth Merry Bixler	L.	Easton	206 Spring Garden
Roger Hunt Blake	C.	Trenton, N. J.	607 High
Frederick Leo Brannon	L.	Hazleton	51 S.
Roland Wilbur Brown	G.S.	Aquashiocla	161 E.
Charles Clare Brownmiller	L.	Shoemakersville	701 High
Wilson Earl Caffey	C.E.	Phillipsburg, N. J.,	Home, 212 Mercer
Francis Arndt Chidsey	Ch.	Easton	133 Bushkill
John Kay Christmas	M.E.	Easton	Sullivan St.
Heston Rarick Cole	C.E.	Succasunna, N. J.,	908 Paxinosa
Earle Johnston Conover	L.	South River, N. J.	42 S.
Harold Alanson Crane	L.	Phillipsburg, N. J.,	Home, 101 So. Main
Ralph Worthington Crane	L.	South Amboy, N. J.,	105 McK.
Benjamin George Dann	C.E.	Beltsville, Md.	Δ Τ Δ

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Pardee F. Day	L.	Hazleton	Θ Δ Χ
Louis Leon deSalignac	C.E.	Pompton Lakes, N. J.	82 N.
Paul Elliott Dodson	L.	Wilkes-Barre	146 P.
Robert Leslie Dunlap	E.E.	Easton	1032 Lehigh
Joseph Raymond Evans	L.	Washington, N. J.	Home
Joshua Grover Everard	L.	Wapwallopen	Δ Τ Δ
Isaac Dill Everitt	M.E.	Hackettstown, N. J.	Φ Δ Θ
Edwin Grone Eyerly	L.	Danville	138 F.
William Voorhees Garretson	Ch.	Perth Amboy, N. J.	23 S.
Fred Lewis Gerard	C.E.	Hampton, N. J.	Σ Χ
William Elwood Gilbert	Ch.	Spring City	64 B.
Leo Alton Gordown	L.	Phillipsburg, N. J.	Home, 7 Heckman
Harold Crane Griffin	E.E.	Phillipsburg, N. J.	Home, 159 Chambers
Fred Passmore Gutelius, Jr.	C.E.	Moncton, N. B., Canada	Φ Κ Ψ
Judah Louis Hahn	L.	Easton	111 So. 4th
Alfred William Handwerk	Ch.	Northampton	165 E.
Benjamin Russell Harrison	E.E.	Easton	216 McC.
Harry Cyphers Hartung	E.E.	Phillipsburg, N. J.	Home, 47 Washington
Herbert Hogg Harvey	L.	Newtown	47 S.
John Kinsey Hefferman	L.	Easton	256 Bushkill
Robert Leon Hefferman	C.E.	Easton	256 Bushkill
George Mathews Henry	G.S.	Lebanon	Δ Υ
Raymond Walker Hill	L.	Metal	44 S.
Floyd Hoffman	G.S.	Califon, N. J.	79 N.
Edward Joseph Hornick	G.S.	Pittsburgh	68 B.
Carl Edwin Houck	L.	Bangor	107 McK.
Samuel McCoy Hunt	E.E.	Sussex, N. J.	Φ Δ Θ
Russell John Hurd	C.E.	Pen Argyl	37 S.
Charles Heebner Ives	L.	Scranton	113 McK.
George Denis Kane	L.	Phillipsburg, N. J.	Home, 224 Chambers
Harold Raudenbush Keeler	L.	Harleysville	133 M.

Name.	Course of Study.	Residence.	Room.
Raymond Grant Kenyon	L.	Easton	Montague Bldg
George Wilbur Kidney	C.E.	Phillipsburg, N. J.	Home, 377 So. Main
Arnold George August Klosé	L.	Great Meadows, N. J.	33 S.
Howard Franklin Koons	C.E.	Perth Amboy, N. J.	23 S.
Israel Krohn	L.	Easton	698 Northampton
John Curry Lee	M.E.	Pottsville	Θ Δ Χ
Harper Ferguson Leeper	C.	Media	Δ Κ Ε
Frank Henry Lehecka	C.E.	Easton	110 Parker Ave.
Frederick Augustus Lehmann	E.E.	Washington, D. C.	109 McK.
Daniel Charles Lichtenwalner	Ch.	Tatamy	Home
Charles Edgar Lothrop	L.	Easton	East Paxinosa Ave.
Clarence Willard Lowden	L.	Delmar, Del	319 McC.
David Lewis McAllister	M.E.	Newton, N. J	132 M.
Joseph Alexander McCurdy	L.	Philadelphia	37 S.
Russell Thomas McFall	C.E.	Flicksville	——
Maxwell McKeen	L.	Easton	310 New
Harry Alexander MacFadden, Jr.	E.E.	Hollidaysburg	Ζ Ψ
Carl Theodore Mack	E.E.	Easton	418 McC.
Joseph Anthony Costello Malloy	C.E.	Trenton, N. J.	Δ Τ Δ
Francis Andrew March, III	Ch.	Easton	Prof. March's
Henry Dusenbery Maxwell, Jr.	M.E.	Easton	208 Spring Garden
Harry Smuller Meily, Jr.	L.	Tyrone	Φ Δ Θ
Howard George Memory	M.E.	Maplewood, N. J.	Δ Τ Δ
Fred Biesecker Merring	L.	East Stroudsburg	105 McK.
Orville Ford Andrew Miller	L.	Easton	924 Butler
Redington Moore	M.E.	Laconia, N. H.	305 New
Donald Adam Mummert	L.	Harrisburg	319 McC.
Paul Wenrick Oliver†	Ch.	York	131 M.
Daniel Hawkins Overton, Jr.	L.	Islip, N. Y.	48 S.
Charles Marvin Pardee	G.S.	Hazleton	Θ Δ Χ
Carl George Paulson	L.	Greenburg	Φ Δ Θ
George Edwin Pidcock	C.E.	Bloomsbury, N. J.	Home
Stewart Hagerty Pursel	Ch.	Phillipsburg, N. J.	Home, Fairview Place
Joseph Bradley Quig	Ch.	Delaware, N. J.	113 McK.

Name.	Course of Study.	Residence.	Room.
James Herbert Quiri	C.E.	Easton	115 McC.
Robert Quiri	L.	Easton	115 McC.
Harold Henry Rahn	C.E.	Kutztown	232 McC.
Harry Lawrence Ramage	C.E.	Florida, N. Y.	175 E.
John Coffey Reese	L.	Shippensburg	114 McK.
Harry Victor Reiner	M.E.	Newark, N. J.	164 E.
Daniel LeRoy Ross	C.E.	Easton	137 So. 12th.
Herman Sheporwich	L.	Wilkes-Barre	136 McC.
Warren Kretchting Sherman	L.	New Germantown, N. J.,	Prof. Hardy's
George Sellers Smith	M.E.	Latrobe	Φ K Ψ
Philip Charles Smith, Jr.	C.E.	Easton	Sullivan
Robert Bitner Smith	E.E.	Connellsville	136 McC.
Sydney Griswold Smith	C.E.	Phillipsburg, N. J.,	Home, 97 So. Main
Earle Spader Snyder	G.S.	Atlantic Highlands, N. J.,	Δ T Δ
Arthur Raymond Bunting Stern	C.E.	Philadelphia	167 E.
Grayson Stickell	L.	Waynesboro	611 High
Mortimer Menville Stocker	L.	Honesdale	42 S.
Frederick Lester Suttle	L.	Phillipsburg, N. J.,	Home, 37 Chambers
Paul Herbert Taylor	E.E.	Camden, N. J.	233 McC.
Frank Fisher Truscott	L.	East Stroudsburg	Δ T Δ
Allen Scott Turner, Jr.	E.E.	Maplewood, N. J.	Δ K E
Forrest Cecil Read Van Horn	L.	Harmony, N. J.	Home
Arthur Richard Walk	L.	Chambersburg	Φ Δ Θ
Edgar Symonds Washburn	M.E.	New York, N. Y.	27 S.
George Charles Watson	L.	Cumberland Gap, Tenn.,	109 McK.
William Francis Wefer	L.	Brooklyn, N. Y.	153 E.
Henry Stanley Welty	C.	Portland	98 McK.
Stewart Means Wikel	E.E.	Marietta	43 S.
Alun Sylvanis Williams	L.	Wilkes-Barre	Σ X
Benjamin Crispin Williams	L.	Berwick	100 McK.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Jacob Benjamin Woehrle, Jr.	C.	Wilkes-Barre	1323 Liberty
Norman Howard Wolbach	E.M.	Easton	37 S. 13th
Emil Robert Zenke	M.E.	Scranton	Χ Φ
William Edward Zinn	Ch.	Easton	221 No. 10th

SOPHOMORES.. 125

FRESHMAN CLASS, 1918.

Name.	Course of Study.	Residence.	Room.
Robert Edward Acorn	L.	Washington, D. C.	———
Lewis Bower Allen	L.	Wilmington, Del	47 S.
James Riehl Arnold	C.E.	Washington, D. C.	116 McK.
Gilbert Jamieson Banks	L.	Chambersburg	Φ Δ Θ
Norman Mitchell Bannerman	L.	Titusville, N. J	41 S.
Elvin Leon Barr	Ch.	Easton	1032 Berwick
Aaron Seibert Bauer	L.	Wilkes-Barre	319 McC.
Richard Bennett Bechtel	C.E.	Trenton, N. J	41 S.
Arthur Hallmeyer Becker	E.E.	Kulpsville	148 P.
Kenneth Bell	G.S.	Pasadena, Cal	Δ K E
Guy Arthur Bensinger	L.	Ashland	147 P.
John Paul Bischoff	L.	Deerfield, N. J	176 E.
Arthur Blasi	L.	Newark, N. J	608 New
Charles Francis Bowman	C.E.	Pittsburgh	Δ K E
Bertine James Boyer	L.	Brodheadsville	212 McC.
Chester Julius Brasso	C.E.	Easton	647 Northampton
Lester Hill Britton	E.E.	Copper Hill, N. J.	314 McC.
Elliott Robinson Brown	G.S.	New York, N. Y.	111 McK.
Thomas Franklin Burley, Jr.	L.	Belvidere, N. J.	232 Cattell
Calvin Leonard Burton	G.S.	Los Angeles, Cal	168 E.
Arthur Chester Camovito	M.E.	Lakewood, N. J	3 S.
Clarence E. Chamberlain	L.	Ogdensburg, N. J	———
Lloyd Raymond Cherry	Ch	Phillipsburg, N. J	———
Howard Baily Cheyney	L.	Williamsport	———
Wayne Notley Clugston	L.	Waynesboro	106 McK.
Berthold Frank Conde	C.E.	High Bridge, N. J.,	1440 Washington
Paul Grandin Condit	L.	Newton, N. J	90 N.
Edwin Roscoe Conklin	L.	Lakewood, N. J	3 S.
Frank Edward Coughlin	G.S.	Luzerne	Δ T Δ
W. Leo Courson	L.	Picture Rocks	127 M.
Willard deCamp Crater	Ch.	Succasunna, N. J.	635 High
Mumford Chamberlain Crossley	G.S.	Binghamton, N. Y.	140 F.
Samuel Augustus Curtiss	C.E.	Norfolk, Conn	15 S.

Name.	Course of Study.	Residence.	Room.
Everett Kelsey Davey	C.E.	Rockaway, N. J.	Δ Υ
Edgar Kirk Dawson	L.	West Cape May, N. J.,	121 McK.
Jose Maria Diaz, Jr	G.S.	Hackensack, N. J.	Φ Κ Ψ
Charles Alvan Dimm	G.S.	Mifflinburg	12 S.
John Edward Doheny	C.E.	Haverford	Δ Υ
Lewis Patrick Dolan	G.S.	Ogdensburg, N. J.	152 P.
Andrew Kenneth Dougall	G.S.	Maplewood, N. J.	Δ Κ Ε
Samuel Douthert, Jr	M.E.	East Orange, N. J.	512 High
George Henry Drake	Ch.	Newark, N. J.	170 E.
John Kilshaw Dunn	G.S.	New York, N. Y.	Ζ Ψ
William McClure Dyer	M.E.	Trenton, N. J.	Φ Δ Θ
Arthur Serfass Eichlin	Ch.	Easton	1627 Northampton
William Leone Eldredge	G.S.	West Cape May, N. J,	118 McK.
George Leonidas Bellas Eurotas	C.	Sparta Greece, 158 So. Main St., Phillipsburg, N. J.	
Robert Arthur Farnam	C.E.	LaCrosse, Wis.	Δ Κ Ε
Joseph Fitts	Ch.	Washington, N. J.	Σ Χ
George Wyckoff Fleming	L.	Washington, N. J.	Home
Leeth Ivan Florey	C.	Pen Argyl	166 E.
Edwin Arnold Forrest	L.	Spring City	66 B.
Harry Joshua Frey	L.	Rochester, N. Y.	Ζ Ψ
Charles Thompson Gallaher	G.S.	Hammond, Kans.	Δ Τ Δ
Frank Royal Gammon	G.S.	Boston, Mass.	Δ Κ Ε
Morris Newton Geissinger	L.	Stroudsburg	45 S.
Philip Julius Goldman	Ch.	Easton	———
Homer Edward Graham	G.S.	Ashley	115 McK.
Paul Staley Grant	L.	Oak Park, Ill.	149 P.
John Fulton Grimm	L.	Newville	Mr. Hatch's
Joseph Guzzetto	L.	Easton	123 South Third
Elbert Wilson Haldeman	L.	Danboro	232 McC.
Robert Forster Hare	L.	Altoona	Φ Κ Ψ
Jonathan Moore Harris	G.S.	Easton	723 Paxinosa
Richard Burd Heffner	L.	Pottsville	90 N.
Hamilton Ritchie Hill	L.	Westbury, N. Y.	Ζ Ψ

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Rosser Almer Huff	G.S.	Bethlehem	Χ Φ
Harold Brekford Hufford	Ch.	Bloomington, Ill.	136 McC.
Alvan Smith Hutchinson	C.E.	Oyster Bay, N. Y.	Φ Δ Θ
Samuel Kenneth Hutchinson	L.	Stroudsburg	45 S.
John Benson Irvin, Jr.	G.S.	Williamsport	Χ Φ
Charles Justus Itter, Jr.	C.E.	Hazleton	10 S.
Albert Thomas Jones	Ch.	Scranton	29 S.
Frank Smith Jones	C.E.	Delaware, N. J.	98 McK.
Geo. Valentine Massey Jones	C.E.	Dover, Del.	Χ Φ
John Wright Kanehann	C.	Phillipsburg, N. J.,	Home, Delaware Park
Roy Buchanan Karn	Ch.	High Bridge, N. J.	Home
John Spencer Kelly	G.S.	Troy, N. Y.	11 S.
Carleton Bannister Kidney	C.E.	Phillipsburg, N. J.,	Home, 377 So. Main
Alvan Ray Kirschner	L.	Hazleton	10 S.
Frank Joseph Klein	G.S.	Easton	204 St. Joseph
Walter Gehret Kleinspehn	Ch.	Reading	159 E.
Edgar Laubach Kline	M.E.	Martin's Creek	Home
Albert Seeger Kohl	L.	Newburgh, N. Y.	Θ Δ Χ
Ernest Evans Kohl	L.	Maryd	173 E.
Kenneth Farrington Kressler	L.	Easton	205 Madison
William Egbert Kressler	G.S.	Easton	205 Madison
Raymond Lewis LaBarre	G.S.	Phillipsburg, N. J.,	Home, 111 So. Main
Miles Benton Layton, Jr.	C.E.	Pittsburgh	———
John Matthew Lemmen, Jr.	E.E.	Easton	1202 Chidsey
Joseph Earl Lenhart	L.	Colmar	232 McC.
Leon Elias Lewis	L.	Mahanoy City	70 B.
Clarence Smaling Line	Ch.	Westtown, N. Y.	152 P.
Irving Otto Lippman	L.	Newark, N. J.	698 Noth'm'n
James Russell Longstreet	M.E.	Manasquan, N. J.	108 McK.
Theodore van Kleeck Lyman	G.S.	Washington, D. C.	87 N.
Donald McBride	G.S.	Brooklyn, N. Y.	Δ Κ Ε
J. Gordon McCrindle	C.E.	Scranton	Φ Κ Ψ
Henry Evan McElfresh	C.E.	Washington, D. C.	228 McC.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM
Albert Wesley McKenney, Jr.	G.S.	Greensburg	Χ Φ
William John McWilliams	L.	Easton	513 Sullivan
Charles Andrew Maloney	M.E.	Philadelphia	Δ Υ
Richard Godfrey Mann	C.E.	Succasunna, N. J.,	908 Paxinosa
Martin Marasco	Ch.	Easton	Prof. Hart's
Arthur Moore Mason	C.	Toms River, N. J.	Δ Κ Ε
Wallace Carlin Maxfield	G.S.	Bloomfield, N. J.	Δ Κ Ε
Paul Heritage Mayhew	E.E.	Woodbury Heights, N. J.	149 P.
John High Mecray	G.S.	Cape May, N. J.	61 B.
Charles Samuel Messinger	L.	Easton	253 Bushkill
Marshall Rinker Metzgar	L.	Stroudsburg	45 S.
Carl Sigman Middaugh	M.E.	Easton	Burke and Paxinosa
Hugh Stewart Millar	L.	Tamaqua	171 E.
Donald Fischer Miller	C.E.	South Orange, N. J.	Δ Κ Ε
Walter McKinley Miller	L.	Hazleton	231 Cattell
Carl Levi Mottice	Ch.	Easton	——
Herman Henry Moyer	Ch.	Bernharts	——
Frank Dewey Munro	L.	Hazleton	231 Cattell
Harry Randolph Hull Nicholas, Jr.	G.S.	Flanders, N. J.	Θ Δ Χ
Clarence Forbes Norment, Jr.	G.S.	Washington, D. C.	Θ Δ Χ
Frank William Officer	C.E.	Council Bluffs, Iowa,	103 McK.
Robert Bertram Overton†	G.S.	Patchogue, N. Y.	48 S.
Charles Gerald Palmer	C.E.	Pen Argyl	172 E.
Russell Winthrop Park	Ch.	Easton	——
Owen Curtis Pearce	L.	Manasquan, N. J.	139 F.
Harold Edgar Peifer	C.E.	Easton	200 No. Tenth
David Oscar Emanuel Peterson	G.S.	Perth Amboy, N. J.	49 S.
Walter Bennett Petry	L.	Trenton, N. J.	212 McC.
John Heber Phillips	C.E.	Steelton	155 E.
Peter Duglass Pittenger	L.	Easton	R. D. No. 3
Porter Grier Polk	G.S.	Danville	Ζ Ψ

Name.	Course of Study.	Residence.	Room.
Charles Clair Pomp	Ch.	Easton	1630 Washington
James Madison Porter, Jr., IV	G.S.	Easton	53 No. Third
James Lewis Prescott	G.S.	Passaic, N. J	132 M.
Earl E. Purcell	L.	Pen Argyl	174 E.
George Flemming Pursel	Ch.	Easton	303 Bushkill
Wellden Pyle	G.S.	Jersey City, N. J.	228 McC.
Edward Christopher Rafferty, Jr.	E.E.	Easton	1015 Butler
Douglass Odenwelder Reed	C.E.	Easton	730 Bushkill
Orion Hughes Reeves	L.	West Cape May, N. J.,	118 McK.
Fred Elliott Renn	Ch.	Shamokin	38 S.
John James Reynolds, Jr	G.S.	Phillipsburg, N. J., Home,	413 So. Main
Stewart Shirley Reynolds	L.	Washington, D. C.	Ζ Ψ
Howard Kenneth Riegel	E.E.	Easton	56 So. Front
Jacob Henry Ritter	E.E.	Weatherly	162 E.
Louis Nicholas Rocca	L.	Easton	204 Lachenour
Nicholas Ralph Rothermel, Jr.	G.S.	Bernharts	701 High
Francis Claire Sams	E.E.	Bath, N. Y	—
Paul Elwood Sandt	M.E.	Easton	506 McC.
Millard Russell Sarson	Ch.	Stewartsville, N. J.,	325 Mercer St., P'burg, N. J.
Thomas Samuel Searles	C.E.	Wilmington, Del.	79 N.
Hoyle Gilman Seeley	Ch.	Scranton	29 S.
Monroe Holmes Shoemaker	M.E.	Elmira, N. Y	Θ Δ Χ
Charles Theodore Seibert, Jr.	C.E.	Pittsburgh	228 McC.
Howard Webster Simmons	E.M.	Cambridge, Md.	Δ Κ Ε
Clarence Frank Smith	G.S.	Connellsville	Φ Δ Θ
Kenneth Milton Smith	G.S.	Latrobe	Φ Κ Ψ
Rayburn F. Smith	C.E.	Mansfield	12 S.
Russell Stanley Stofflet	G.S.	Stroudsburg	—
Harry Houser Stolberg	C.E.	Canton, Ohio	Θ Δ Χ
Edwin Smyser Strawbridge	L.	York	Ζ Ψ
Harry Owen Swartz	G.S.	Llanerch	—
Edwin Humes Temple	Ch.	Hazleton	Δ Τ Δ
William Philip L. Thomas, Jr.	E.E.	South Bethlehem	143 P.

NAME.	COURSE OF STUDY.	RESIDENCE.	ROOM.
Charles Henry Linten Thompson	L.	Enhant	157 E.
Ross DeBruler Thompson	G.S.	Washington, D. C.	Θ Δ Χ
John DeWitt Toll, Jr.	G.S.	Philadelphia	———
Hugh Oscar Tompkins	L.	Ocean Grove, N. J.	142 P.
George Lincoln Townsend	G.S.	Washington, D. C.	Θ Δ Χ
Nathaniel Taylor Trembath	L.	Kingston	115 McK.
Wesley Morris Totten	E.E.	Jersey City, N. J.	———
John Henderson Trubee	L.	Derby, N. Y.	140 F.
Clarence Henry Tucker	G.S.	Pen Argyl	———
William Berner Ulmer	G.S.	Pottsville	Θ Δ Χ
William A. VanBlarcom	G.S.	Monroe, N. J.	108 McK.
Frederick William Vigelius	M.E.	Easton	Ζ Ψ
John Brennen Edward Vilsack	G.S.	Pittsburgh	Θ Δ Χ
William James Walker, Jr.	G.S.	Philadelphia	89 N.
Laurens Washington Wallazz	Ch.	Easton	130 McC.
George Russell Waltman	Ch.	Easton	513 Center
Warren Loudenburg Wambold	Ch.	Phillipsburg, N. J.,	Home, 59 Brainerd
Albert Mathis Weber	C.E.	Washington, D. C.	116 McK.
Roy Stogden Weidman	M.E.	Phillipsburg, N. J.,	Home, 90 So. Main
John Ambrose Weldon	L.	Watertown, N. Y.	Ζ Ψ
Edward Russell White	G.S.	Rutland, Vt.	Ζ Ψ
J. Ludlow White	M.E.	Easton	East Ave. and Monroe
Thomas Willever	G.S.	Phillipsburg, N. J.,	Home, 1083 S. Main
William Everard Williams	C.E.	Washington, D.C.	Χ Φ
William Sampson Williams	E.E.	Minersville	212 McC.
Edmund Oscar Wilson	M.E.	Phillipsburg, N. J.	———
Holt Chaddock Wilson	C.E.	New York, N. Y.	———
Harry Ellsworth Winters	L.	Holtwood	131 M.
Carl Robert Wolbach	C.E.	Easton	37 So. 13th
William Moodie Woodruff	E.E.	Trenton Junction, N. J.,	151 P.
Harold Leslie Woods	M.E.	Easton	Chestnut and Cattell
David John Zehner	C.E.	Easton	330 No. Seventh

FRESHMEN 195

ABBREVIATIONS FOR BUILDINGS AND COURSES OF STUDY.

Brd.—Brainerd Hall.
B.—Blair Hall.
E.—East Hall.
F.—Fayerweather Hall.
K.—Knox Hall.
M.—Martien Hall.
McC.—McCartney St.
McK.—McKeen Hall.
N.—Newkirk Hall.
P.—Powell Hall.
S.—South College.
Δ K E—Fraternity House.
Σ X—Fraternity House.
Θ Δ X—Fraternity House.
Φ Δ Θ—Fraternity House.
Φ K Ψ—Fraternity House.
Z Ψ—Fraternity House.
X Φ—Fraternity House.
Δ ϒ—Fraternity House.
Δ T Δ—Fraternity House.

C.—Classical.
C.E.—Civil Engineering.
Ch. Chemical.
E.E.—Electrical Engineering.
E.M.—Mining Engineering.
G.S.—General Scientific.
L.—Latin Scientific.
M.E.—Mechanical Engineering.
†—Reciting on schedule.
—— —Absent at time of publication of catalogue.

SUMMARY.

Courses	Seniors.	Juniors.	Sophomores.	Freshmen.	Total
Graduates	...	...	...	...	16
Classical	9	8	5	4	26
Latin Scientific	33	34	39	37	143
Latin Scientific. Electing Greek	...	8	13	19	40
General Scientific	10	14	9	50	83
Civil Engineering	15	27	23	33	98
Electrical Engineering	13	14	13	12	52
Mining Engineering	4	2	1	1	8
Mechanical Engineering	5	10	12	14	41
Chemical	14	19	10	25	68
Totals	103	136	125	195	575

CLASSIFICATION BY RESIDENCE (Non-graduates.)

Arkansas	1	Maryland	4	Vermont	1
California	2	Massachusetts	2	Virginia	1
Connecticut	5	New Hampshire	1	Wisconsin	1
Delaware	5	New Jersey	148		
Dist. of Columbia	22	New York	39	Canada	2
Illinois	2	Ohio	3	China	1
Indiana	2	Pennsylvania	311	Greece	1
Iowa	1	Tennessee	1	South America	1
Kansas	1	Texas	1		

For further information, address "The Registrar, Lafayette College, Easton, Pennsylvania."

LH1

VOL. 10, NO. 1 FEBRUARY, 1916

BULLETIN
OF
LAFAYETTE COLLEGE

GENERAL CATALOGUE
1915-1916

PUBLISHED QUARTERLY BY LAFAYETTE COLLEGE

Entered as second-class matter November 20, 1906, at Easton, Pennsylvania,
under the Act of Congress of July 16, 1894.

CORRESPONDENCE

Correspondence addressed Lafayette College, Easton, Pennsylvania, may be expected to reach the proper department. To avoid delay, however, correspondents are requested to address letters as follows:

Requests for catalogues and inquiries regarding admission should be addressed to the REGISTRAR.

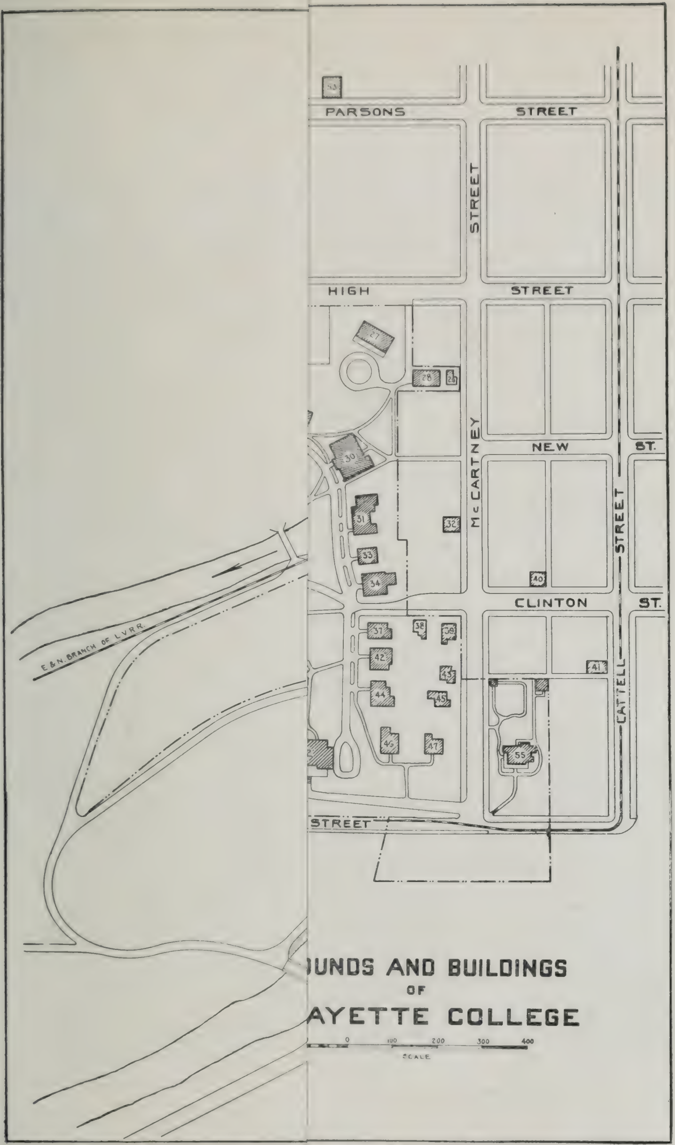
Inquiries regarding scholarship aid should be addressed to the ASSISTANT TO THE PRESIDENT.

Inquiries regarding students of the College, excuses from parents, etc., should be addressed to the DEAN.

Inquiries regarding dormitory rooms should be addressed to the SUPERINTENDENT OF BUILDINGS.

All payments and bills should be addressed to the BURSAR.

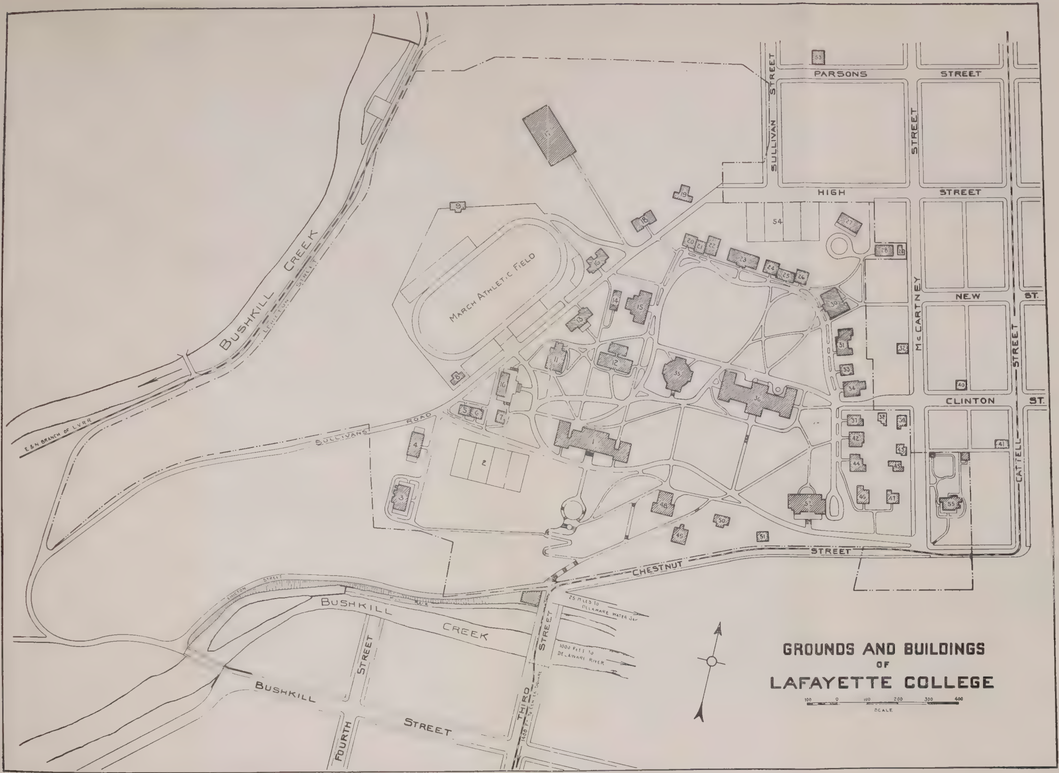
Correspondence regarding the general interests of the College should be addressed to the PRESIDENT.



1 South College.
2 West Tennis Courts.
3 Chi Phi.
4 Delta Tau Delta.
5 Professor Rankin.
6 Professor Martin.
7 College Offices.
8-9 Field Houses.
10 Theta Delta Chi.

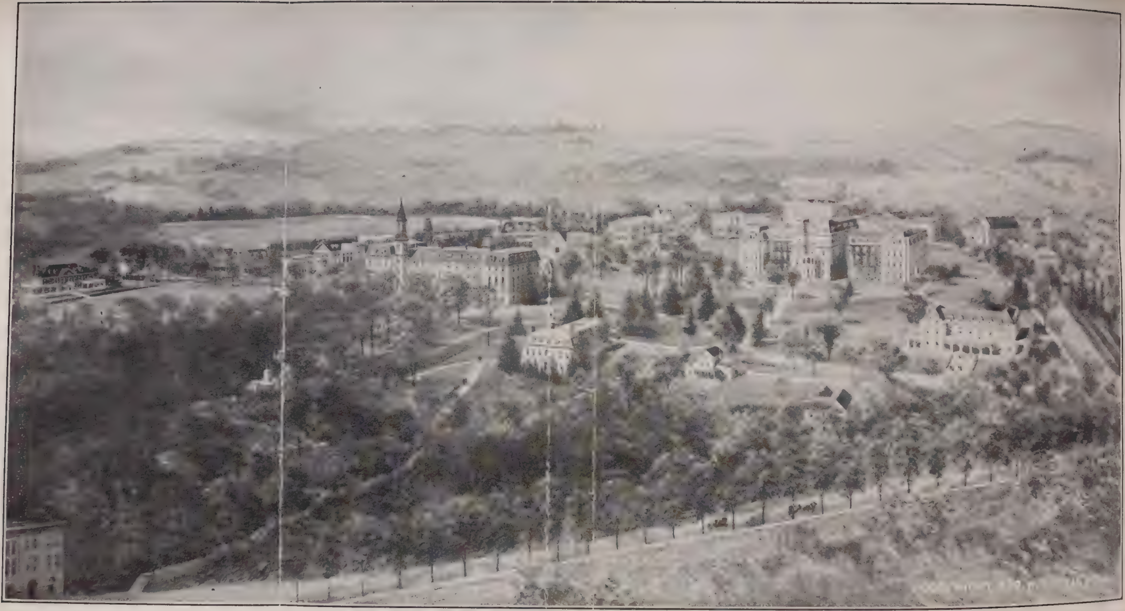
11 Gymnasor Hall.
12 Van Wsor Peck.
13 Phi Desor Lyle.
14 Greenbsor Kunkel.
15 Gayley Laboratory of
istry ogy.
16 Delta Plant.
17 Mechasor Hart.
ing e Laboratory.

52 Zeta Psi.
53 Omega Delta Phi.
54 Tennis Courts.
55 Pres. MacCracken.



GROUNDS AND BUILDINGS
OF
LAFAYETTE COLLEGE

1 South College.
2 West Tennis Courts.
3 Chi Phi.
4 Delta Tau Delta.
5 Professor Rankin.
6 Professor Martin.
7 College Offices.
8-9 Field Houses.
10 Theta Delta Chi.
11 Gymnasium.
12 Van Wickle Library.
13 Phi Delta Theta.
14 Greenhouse.
15 Gayley Hall of Chemistry.
16 Delta Kappa Epsilon.
17 Mechanical Engineering Building.
18 Phi Kappa Psi.
19 Traill Green Observatory.
20 Blair Hall.
21 Knox Hall.
22 Newkirk Hall.
23 McKeen Hall.
24 Martien Hall.
25 Fayerweather Hall.
26 Powell Hall.
27 Phi Gamma Delta.
28 East College.
29 Infirmary.
30 Brainerd Hall.
31 Delta Upsilon.
32 Alpha Chi Rho.
33 Professor March.
34 Professor Tupper.
35 Memorial Chapel.
36 Pardee Hall.
37 Professor Youngman.
38 Professor Fehr.
39 Professor Wysor.
40 Sigma Chi.
41 Sigma Nu.
42 Professor Gordon.
43 Professor Owen.
44 Professor Hall.
45 Professor Peck.
46 Professor Lyle.
47 Professor Kunkel.
48 Jenks Laboratory of Biology.
49 Steam Plant.
50 Professor Hart.
51 Private Laboratory.
52 Zeta Psi.
53 Omega Delta Phi.
54 Tennis Courts.
55 Pres. MacCracken.



LAFAYETTE COLLEGE, EASTON, PENNSYLVANIA.

CONTENTS

Calendar........ 4
Trustees........ 6
Faculty........ 8
Officers of Administration........ 13
Origin and History........ 14
Location........ 15
Admission........ 16
Curriculum........ 24
Exhibit of Studies........ 29
I-III—Arts and Pure Science:
  Leading to Degree of Bachelor of Arts........ 29
    of Bachelor of Philosophy........ 30
    of Bachelor of Science........ 31
IV—Technical Courses. Leading to Degree of Bachelor of Science:
  Freshman year........ 32
  Sophomore year........ 33
  in Chemical Engineering........ 36
  in Civil Engineering........ 37
  in Electrical Engineering........ 38
  in Mechanical Engineering........ 39
  in Mining Engineering........ 40
V—Leading to Degree of Bachelor of Science in Chemistry..34, 41
  Two-year course for pre-medical students........ 35
Time Schedules........42–49
Courses of Instruction by Departments:
    Bible........ 50
  Group I.—Language and Literature:
    English........ 50
    Greek........ 52
    Latin........ 57
    Modern Languages:
      French........ 58
      German........ 59
      Italian........ 60
      Spanish........ 60
  Group II.—Education, History, Philosophy and Political Science:
    Economics........ 61
    Government and Law........ 61
    History........ 61

- Philosophy and Education.... 62
- Sociology.... 63

Group III.—Mathematics and Sciences:

- Biology.... 63
- Chemistry and Metallurgy.... 64
- Geology.... 68
- Graphics.... 69
- Mathematics.... 71
- Physics.... 73

Group IV.—Engineering:

- Civil Engineering.... 75
- Electrical Engineering.... 82
- Mechanical Engineering.... 85
- Mining Engineering.... 88

Physical Training and Hygiene.... 90
Fees and Expenses.... 91
Scholarships.... 93
Rooms and Board.... 95
Medical Treatment.... 95
Buildings.... 96
Library and Reading Room.... 100
Scientific Collections.... 102

General Information:

- Examinations and Standing.... 103
- Graduation and Degrees.... 103
- Master's Degree.... 104
- Terms and Vacations.... 104
- Prizes.... 105
- Religious Instruction.... 109
- Public Lectures.... 111
- College Societies.... 112
- College Athletics and Publications.... 114

Degrees Conferred 1915.... 115
Honors and Prizes 1915.... 118
Alumni Associations.... 123
Roll of Students.... 125
Form of Bequest.... 145
Index.... 146

CALENDAR

1916.

Jan. 6—Thursday, 9.50 A.M., Christmas recess ends.
Feb. 2—Wednesday, 12 M., First term ends.
Feb. 3—Thursday, 11.30 A.M., Stated Meeting of the Board of Trustees.
Feb. 3–6—Thursday–Sunday, Junior Week recess.
Feb. 7—Monday, 9.50 A.M., Second term begins.
Feb. 22—Tuesday, Washington's Birthday. Holiday.
Feb. 24—Thursday, Day of Prayer for Colleges. Service at 11 A.M.
Apr. 19—Wednesday, 12 M., Easter vacation begins.
Apr. 27—Thursday, 9.50 A.M., Easter vacation ends.
May 4—Thursday, 11.30 A.M., Stated Meeting of the Board of Trustees.
May 30—Tuesday, Memorial Day. Holiday.
June 3—Saturday, Senior examinations end.
June 10—Saturday, Examinations of lower classes end.
June 11—Sunday, 10.30 A.M., Baccalaureate Sermon; 8 P.M., Sermon before Brainerd Society.
June 12—Monday, 11.30 A.M., Stated Meeting of the Board of Trustees. 2 P.M., Senior Class Day exercises.
June 13—Tuesday, Alumni Day.
June 14—Wednesday, 9.45 A.M., Commencement.
Sept. 11—Monday, 9. A.M. to 12 M., 2 P.M. to 4 P.M., Registration for entrance.
Sept. 12–13—Tuesday, Wednesday, 9 A.M., Examinations for admission. Re-examinations, three upper classes.
Sept. 14—Thursday, 9.50 A.M., 85th College year begins.
Oct. 5—Thursday, 11.30 A.M., Meeting of the Board of Trustees.
Oct. 25—Wednesday, Founders' Day. Dedication of the Memorial Chapel.
Nov. 22—Wednesday, 12 M., to November 27, Monday, 9.50 A.M., Thanksgiving recess.
Dec. 20—Wednesday, 12 M., Christmas recess begins.

1917.

Jan. 4—Thursday, 9.50 A.M., Christmas recess ends.
Jan. 31—Wednesday, 12 M., First term ends.
Feb. 1—Thursday, 11.30 A.M., Stated Meeting of the Board of Trustees.
Feb. 1–4—Thursday–Sunday, Junior Week recess.
Feb. 5—Monday, 9.50 A.M., Second term begins.
Feb. 15—Thursday, Day of Prayer for Colleges. Service at 11 A.M.
Feb. 22—Thursday, Washington's Birthday. Holiday.
Apr. 4—Wednesday, 12 M., Easter vacation begins.
Apr. 12—Thursday, 9.50 A.M., Easter vacation ends.
May 3—Thursday, 11.30 A.M., Stated Meeting of the Board of Trustees.
May 30—Wednesday, Memorial Day. Holiday.
June 2—Saturday, Senior examinations end.
June 9—Saturday, Examinations of lower classes end.
June 10—Sunday, 10.30 A.M., Baccalaureate Sermon; 8 P.M., Sermon before Brainerd Society.
June 11—Monday, 11.30 A.M., Stated Meeting of the Board of Trustees. 2 P.M., Senior Class Day exercises.
June 12—Tuesday, Alumni Day.
June 13—Wednesday, 9.45 A.M., Commencement.

TRUSTEES

LIFE TRUSTEES

John Welles Hollenback, Esq.	Wilkes-Barre, Pa.
Hon. William S. Kirkpatrick, LL.D. *Vice-President*	Easton, Pa.
Rev. Ethelbert D. Warfield, D.D., LL.D.	Chambersburg, Pa.
Isaac P. Hand, Esq.	Wilkes-Barre, Pa.
James Gayley, M.E., Sc.D.	New York City.
Rev. D. J. Waller, Jr., Ph.D., D.D.	Bloomsburg, Pa.
Israel P. Pardee, M.E., *President*	Hazleton, Pa.
Charles B. Adamson, M.S.	Philadelphia, Pa.
J. Renwick Hogg, A.M.	Philadelphia, Pa.
McCluney Radcliffe, M.D., LL.D.	Philadelphia, Pa.
Rev. Leighton W. Eckard, D.D.	Philadelphia, Pa.
Edgar M. Green, M.D.	Easton, Pa.
John Markle, M.E.	Jeddo, Pa.
Edward J. Fox, Esq.	Easton, Pa.
David Bennett King, Esq.	New York City.
Nathan Grier Moore, Esq.	Chicago, Ill.
William E. Baker, C.E.	New York City.
Rev. John B. Laird, D.D.	Frankford, Pa.
John E. Fox, Esq.	Harrisburg, Pa.
Rev. Albert J. Weisley, D.D.	Scranton, Pa.
Simon Cameron Long, C.E.	Philadelphia, Pa.
John H. MacCracken, Ph.D., LL.D.	Easton, Pa.

ALUMNI TRUSTEES

Class of 1916

A. C. Overholt, B.S., A.M.	Scottdale, Pa.
Wayne Dumont, Esq.	Paterson, N. J.

Class of 1918

Emery J. Kerrick, C.E.	Germantown, Pa.
William A. May, A.M., C.E.	Scranton, Pa.

Class of 1920

Charles Heebner, Esq.	Philadelphia, Pa.
J. George Becht, Sc.D.	Harrisburg, Pa.

STANDING COMMITTEES OF THE BOARD OF TRUSTEES

Executive Committee

MESSRS. MACCRACKEN, PARDEE, KIRKPATRICK, FOX, BAKER.

Increase of the Endowment and Equipment of the College

MESSRS. BAKER, PARDEE, KING, HOGG, JOHN E. FOX, GAYLEY, RADCLIFFE, OVERHOLT

Vacancies

MESSRS. MACCRACKEN, HOLLENBACK, HAND, ECKARD, PARDEE

Liberal Arts Curriculum

MESSRS. WALLER, RADCLIFFE, KING, LAIRD

Technical Curriculum

MESSRS. GAYLEY, BAKER, LONG, MAY, PARDEE

Honorary Degrees

MESSRS. ECKARD, LAIRD, KIRKPATRICK, E. J. FOX, WALLER, JOHN E. FOX, MACCRACKEN

Library

MESSRS. PARDEE, HAND, HOGG, KING

Athletics

MESSRS. ADAMSON, RADCLIFFE, JOHN E. FOX

Fraternity Houses

MESSRS. RADCLIFFE, OVERHOLT, GREEN, KIRKPATRICK

The President of the Board and the President of the College are members of all standing committees *ex officio.*

FACULTY

John Henry MacCracken, Ph.D., LL.D. Chestnut St.
President
John I. Blair Foundation.

Rev. Robert Barber Youngman, A.M., Ph.D. Campus
Emeritus Professor of the Greek Language and Literature

William Baxter Owen, A.M., Ph.D., Litt.D.
Professor of the Latin Language and Literature McCartney St.
Chairman of the Arts and Science Council

Edward Hart, Ph.D. Campus
Dean of the Pardee Scientific Department, Professor of Analytical Chemistry
William Adamson Professorship of Analytical Chemistry.

James Madison Porter, C.E. 53 North Third St.
Professor of Civil Engineering and Director of the Division

Francis A. March, Jr., A.M., Ph.D. Campus
Professor of the English Language
Francis A. March Professorship.

William Shafer Hall, C.E., E.M., M.S. Campus
Professor of Mathematics; Clerk of the Faculty
George W. Hollenback Professorship.

Edgar Moore Green, A.M., M.D. 222 Spring Garden St.
Consulting Physician in the Department of Physical Training

Frederick Burritt Peck, Ph.D. McCartney St.
Professor of Mineralogy and Geology

Clarence McChenyne Gordon, Ph.D. Campus
Professor of Physics

James Waddell Tupper, Ph.D. Campus
Professor of English Literature
Secretary of the Arts and Science Council

James Theron Rood, Ph.D. 424 Clinton St.
Professor of Electrical Engineering and Director of the Division; Chairman of the Engineering Council

William Thomas Lyle, C.E. Campus
Professor of Municipal Engineering

EDWIN MOORE RANKIN, A.M., PH.D. *Professor of Greek*	Campus
EDWIN OBERLIN FITCH, JR., M.S. *Professor of Mechanical Engineering and Director of the Division*	2091 Wayne Ave
HENRY WYSOR, B.S. *Professor of Metallurgy*	Campus
OTHO MCCARROLL GRAVES, B.S. in C.E. *Professor of Graphics* *Secretary of the Engineering Council*	315 Lafayette St.
REV. SAMUEL ALBERT MARTIN, A.M., D.D. *Professor of Mental and Moral Philosophy* James Renwick Hogg Professorship.	Campus
CARL DANIEL FEHR, A.M. *Professor of Modern Languages*	Campus
WILLIAM MACKAY SMITH, PH.D. *Associate Professor of Mathematics and Registrar*	Mattes Lane
BEVERLY WAUGH KUNKEL, PH.D. *Professor of Biology* Jesse Chamberlain Professorship of Botany.	Campus
JAMES BRYANT HOPKINS, A.M. *Assistant Professor of Romance Languages*	614 Coleman St.
WILLIAM BENJAMIN MARQUARD, E.M. *Assistant Professor of Mining Engineering* George B. Markle Professorship.	626 Parsons St.
ERNEST DEAN TANZER, E.E. *Assistant Professor of Electrical Engineering*	Mattes Lane
ALBERT K. HECKEL, PH.D. *Assistant Professor of History and Assistant Dean*	731 Reeder St.
RAYMOND HENRY LACEY, A.M., PH.D. *Assistant Professor of Latin*	226 Porter St.
WILLIAM TRUMBOWER FOSTER, PH.B., M.S. *Assistant Professor of Biology*	707 Coleman St.
D. ARTHUR HATCH, E.M. *Assistant Professor of Mathematics*	705 High St.

Harry Thomas Spengler, C.E. — 377 Shawnee Drive
Assistant Professor of Surveying and Railroad Engineering

V. Ray Jones, A.M. — South College
Assistant Professor of German

John L. Stewart, Ph.D. — So. Bethlehem
Special Lecturer on Economics

James Henry DeLong, B.S. — 906 McCartney St.
Instructor in Chemistry

William Huntington Kirkpatrick, A.B. — 123 Reeder St.
Instructor in Municipal Law

Harold Anson Bruce — Blair Hall
Director of Physical Training

John Cawley, M.S. — 627 Coleman St.
Instructor in Mathematics

A. Henry Fretz, Ph.B., C.E. — 400 Reeder St.
Instructor in Geology and Mineralogy

Harold John Lockwood, E.E. — 624 Parsons St.
Instructor in Physics

Clifford Elliott Williams, B.S. in C.E. — 625 Monroe St.
Instructor in Cement Engineering

Arthur Dodd Snyder, A.B. — 219 South Tenth St.
Instructor in Mathematics

Elbert Ross, B.S. in Chem. — 805 Cattell St.
Instructor in Chemistry

Charles Garfield Eichlin, A.B. — 1627 Northampton St.
Instructor in Physics

Henry Clinton Hutchins, A.M. — 324 New St.
Instructor in English

Edgar Colby Knowlton, A.M. — 322 New St.
Instructor in English

Clinton Ellicott Pearce, B.S. — 100 Cattell St.
Instructor in Mechanical Engineering

WILLIAM WALLAESA *Instructor in Foundry*	1106 Washington St.
WILLIAM ASTON, A.B. *Instructor in Latin and Sociology*	423 McCartney St.
JOHN PFROMM, B.S. in CHEM. *Instructor in Chemistry*	92 McKeen Hall
FREDERICK HIRAM SPOTTS, A.B. *Instructor in History and Mathematics*	127 Martien Hall
ALBERT MORTON BIERSTADT, A.M. *Instructor in English*	409 Clinton St.
ROBERT VINCENT CRAM, A.M. *Instructor in Greek*	101 McCartney St.
BENJAMIN F. LUKER, M.A. *Instructor in Romance Languages*	848 Paxinosa Ave.
RALPH HENRY MOORE, B.S. in C.E. *Instructor in Graphics*	Powell Hall.
ROBERT S. JOHNSTON, B.S. in C.E. *Instructor in Civil Engineering*	817 Porter St.
T. MCKEEN CHIDSEY, A.B., LL.B. *Instructor in International Law*	107 Wayne Ave.
SAMUEL D. CARPENTER, M.E. *Instructor in Machine Shop*	1008 Wilkes-Barre St.
NEVIN CECIL MITMAN *Instructor in Forge Work*	1311 Washington St.
LUTHER A. FLOWERS *Instructor in Pattern Making*	721 Bushkill St.
WILBUR A. BRYAN, PH.B. *Assistant in Physics*	Newkirk Hall

STANDING COMMITTEES OF THE FACULTY

Organization and By-Laws

Professors PORTER, MARCH, MARTIN, ROOD, HALL, GORDON, GRAVES

Terms and Vacations

Professors PECK, LYLE, RANKIN

Curriculum

Professors MACCRACKEN, OWEN, HART, PORTER, TUPPER, FITCH, KUNKEL

Schedule

Professors SMITH, GRAVES, FEHR

Accredited Schools and Admission

Professors SMITH, HECKEL, HALL

Attendance and Standing

Professors HALL, SMITH, HECKEL, FITCH, FEHR

Discipline

Professors HECKEL, LYLE, SMITH, HATCH, SPENGLER

Student Organizations

Professors GRAVES, WYSOR, HECKEL, HATCH, JONES

Publications

Professors TUPPER, SMITH, HOPKINS

Athletics

Professors MARCH, MARQUARD, FITCH, GORDON, HECKEL, BRUCE, CROWELL

Apparatus and Equipment

Professors HART, PORTER, GORDON, FITCH, KUNKEL

Library

Professors STONECIPHER, OWEN, MARCH, HECKEL, FOSTER

Public Lectures and Social Life

Professors TUPPER, MARTIN, RANKIN, ROOD, GRAVES

OFFICERS OF ADMINISTRATION

John Henry MacCracken, Ph.D., LL.D. *President*	Administration
William S. Hall, C.E., E.M., M.S. *Clerk of the Faculty*	South College
Edward Hart, Ph.D. *Dean of the Pardee Scientific Department, Curator of Gayley Hall, and Librarian of the Henry W. Oliver Library*	Gayley Hall
Albert K. Heckel, Ph.D. *Assistant Dean*	South College
William Mackay Smith, Ph.D. *Registrar*	South College
Rev. John F. Stonecipher, D.D. *Librarian*	Van Wickle Library
Rev. Maurice A. Filson, A.M. *Assistant Librarian*	Van Wickle Library
William T. Foster, M.S. *Curator of the Biological Museum*	Jenks Hall
Albert Moore Lane, Ph.B. *Bursar and Superintendent of Grounds and Buildings*	Administration
David B. Skillman, A.B. *Assistant to the President*	Administration
John Edgar Fretz, A.M., M.D. *Physician*	Third and Spring Garden Sts.
Harold Anson Bruce *Director of Physical Training*	Gymnasium
Wilmer G. Crowell *Director of Athletics*	Administration

LAFAYETTE COLLEGE

ORIGIN AND HISTORY

The first organized movement to establish a college at Easton took the form of a meeting held on the evening of December 27, 1824, at White's Hotel, in the northeast corner of the Public Square. Due notice had been given and a large number of public spirited citizens came together to talk the matter over. Col. Thomas McKeen presided. After full discussion, it was unanimously voted "That it is expedient to establish at this place an institution of learning in which the dead languages and the various branches of education and science usually taught in colleges, together with the French and German languages, civil and military engineering, and military tactics shall be taught."

General Lafayette had landed in New York City on the sixteenth of August preceding and his progress through the land had been marked by one continuous ovation. It was therefore resolved "That as a testimony of respect for the talents, virtues and signal service of General Lafayette in the great cause of freedom, the said institution be named Lafayette College."

James M. Porter, Joel Jones and Jacob Wagner were appointed a committee "to draft a memorial to the Legislature for a charter of incorporation and for legislative aid." The legislature granted the charter March 9, 1826. The Board of Trustees organized May 15, 1826, by electing James M. Porter, President, Joel Jones, Secretary, and Thomas McKeen, Treasurer. Attempts were made in 1827 and in 1828 to inaugurate instruction but it was not until February 6, 1832, that George Junkin was secured as President and the sixty acre farm and buildings of Christopher Midler on the south bank of the Lehigh leased for two years as a temporary site for the new institution.

The regular exercises of the college began May 9, 1832. Nine acres of the present sixty acres were purchased shortly after. Ground was broken for a building June, 1833. On July 4, 1833, the corner stone of the building now known as South College was laid with appropriate ceremonies. The building was completed and the formal inauguration exercises of the first president and faculty were held in the College Hall, May 1, 1834. In 1850 overtures were made to the Synod of Philadelphia and the college entered into formal relations with the Presbyterian Church. An amendment was secured to the Charter giving the Synod the right of nominating the trustees and instructors of the College. A subsequent amendment in 1884, restored the right of election to the Board of Trustees but continued to the Synod a right of veto upon such elections.

Pardee Hall, the gift of Ario Pardee, Esq., of Hazleton, was completed October 21, 1873, at a cost of over $200,000 and the Pardee Scientific Department established by large gifts for endowment from the same generous hand.

In 1907 an endowment fund of five hundred thousand dollars was secured in celebration of the seventy-fifth anniversary, the largest donors being Mr. and Mrs. Ralph Voorhees, Mr. Andrew Carnegie, and the General Education Board, who together subscribed one-half the amount. Additions were made to the campus from time to time through the gifts of Hon. John I. Blair and others, and buildings described elsewhere in this catalog were erected, until the investment in land and buildings now represents nearly a million and a half dollars.

LOCATION

Lafayette College is situated upon a hill overlooking the city of Easton, Pennsylvania, the center of an urban population of something over forty thousand inhabitants. The site is one of remarkable beauty immediately above the confluence of the Delaware and Lehigh rivers commanding fine views of the Delaware Valley and of the hills of New Jersey beyond. Its elevation on a limestone plateau a hundred and fifty feet above the river with a southern exposure and an uninterrupted sweep of open country to the Delaware Water Gap and the Pocono Mountains twenty-five miles to the north furnishes natural conditions particularly favorable to health.

Easton is a railroad center and easily accessible from all directions. It is about seventy-five miles from New York, seventy from Philadelphia, eighty from Scranton, and one hundred from Wilkes-Barre and Harrisburg. The Lehigh Valley, Pennsylvania, N. J. Central, Phila. & Reading, D. L. & W., and L. & H. Railways afford convenient and rapid facilities for railway travel.

ADMISSION TO COLLEGE

CLASSIFICATION

All correspondence relating to admission of students should be addressed to the Registrar.

Students are classified upon entrance in five divisions according to the subjects presented for admission and the degrees which they seek, as follows:

Division I. Candidates for the Degree of Bachelor of Arts.

Division II. Candidates for the Degree of Bachelor of Philosophy.

Division III. Candidates for the Degree of Bachelor of Science.

Division IV. Candidates for the Degrees of Bachelor of Science in Chemical Engineering, in Civil Engineering, in Electrical Engineering, in Mechanical Engineering, in Mining Engineering.

Division V. Candidates for the Degree of Bachelor of Science in Chemistry. Students taking the two-year pre-medical course.

REQUIREMENTS FOR ADMISSION

It is expected that every applicant for admission shall have successfully completed at least the equivalent of a four-year high school course, averaging sixteen hours a week through four years, and shall be a young man of good moral character and good health.

Students who expect to enter Lafayette College upon graduation from an accredited preparatory school or a four-year high school should apply by mail to the Registrar for a blank "Entrance Certificate," which will be sent upon request. This certificate, when properly filled out and signed by the principal of the school, should be filed, either by mail or in person, with the Registrar and the matriculation fee of ten dollars paid.

The Registrar will present the certificate to the faculty Committee on Admission of Students, and will advise the student whether the certificate meets the requirements for admission, or, if deficient, in what subjects the student must make further preparation.

Students who have not attended an accredited school, or whose preparation has been irregular or deficient in certain subjects, are required to show that they are qualified in the subjects required for admission by passing the examinations conducted by Lafayette College in September or the examinations conducted by the College Entrance Board in June.

Students entering Lafayette from other colleges are required to present an official record of their scholastic work and also a certificate of honorable dismissal.

The admission requirements are reckoned in terms of units. A unit is defined as work in one subject which is equal to one-quarter of the entire work in the complete High School course for one year. This may mean a subject taken four or five periods a week throughout the school year, or two or three periods a week throughout two years. The requirement for all divisions of the Freshman class is fourteen and one-half units. The subjects required for the various divisions are given below.

For admission to Division I as a candidate for the Degree of Bachelor of Arts:

Subject	Units
English	3
History	1
Mathematics	2 1/2
Latin or Greek	3
Latin, Greek, or Modern Languages	4
Elective	1
Total	14 1/2

For admission to Division II as a candidate for the Degree of Bachelor of Philosophy:

English	3
History	1
Mathematics	2 1/2
Latin	3
Other Foreign Languages	2
Science	1
Elective	2
	14 1/2

For admission to Division III as a candidate for the Degree of Bachelor of Science or to the pre-medical course:

English	3
History	1
Mathematics	$2^1/_2$
Foreign Language	2
Second Foreign Language or 3rd year For. Lang. 1, and Math. 1	2
Science	1
Elective	3
	$14^1/_2$

For admission to Division IV as a candidate for a degree in Engineering or to Division V as a candidate for a degree in Chemistry:

English	3
History	1
Mathematics	4
Modern Foreign Language	2
Physics or Chemistry	1
Elective	$3^1/_2$
	$14^1/_2$

Any of the subjects defined below except English may be offered as electives.

DEFINITION OF REQUIREMENTS

English.. 3 units

1. A command of correct and clear English, spoken and written.

2. A careful reading knowledge of works elected from the prescribed groups—classics in translation, Shakespeare, prose fiction, essays and biography, and poetry.

Books to be read: 1915-19.

Group I.—Classics in Translation. The *Old Testament*, comprising at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings, and Daniel, together with the books of Ruth and Esther. The *Odyssey*, with the omission, if desired, of Books I, II, III, IV, V, XV, XVI, XVII. The *Iliad*, with the omission, if desired, of Books XI, XIII, XIV, XV, XVII, XXI. The *Aeneid*. The *Odyssey*, *Iliad* and *Aeneid* should be read in English translations of recognized literary excellence. For any selection from this group a selection from any other group may be substituted.

Group II.—Shakespeare. *Midsummer-Night's Dream, Merchant of Venice, As You Like It, Twelfth Night, The Tempest, Romeo and Juliet, King John, Richard II, Richard III, Henry V, Coriolanus, Julius Caesar, Macbeth, Hamlet.*

Group III.—Prose Fiction. Malory: *Morte d'Arthur* (about 100 pages); Bunyan: *Pilgrim's Progress*, Part I; Swift: *Gulliver's Travels* (voyages to Lilliput and to Brobdingnag); Defoe: *Robinson Crusoe*, Part I; Goldsmith: *Vicar of Wakefield;* Frances Burney: *Evelina;* Scott's Novels: any *one;* Jane Austen's novels: any *one;* Maria Edgeworth: *Castle Rackrent*, or *The Absentee;* Dickens' novels; any *one;* Thackeray's novels: any *one;* George Eliot's novels: any *one;* Mrs. Gaskell: *Cranford;* Kingsley: *Westward Ho;* or *Hereward, the Wake;* Reade: *The Cloister and the Hearth;* Blackmore: *Lorna Doone;* Hughes: *Tom Brown's Schooldays;* Stevenson's *Treasure Island*, or *Kidnapped*, or *Master of Ballantrae;* Cooper's novels: any *one;* Poe: *Selected Tales;* Hawthorne: *The House of the Seven Gables*, or *Twice Told Tales*, or *Mosses from an Old Manse;* A collection of *Short Stories* by various standard writers.

Group IV.—Essays, Biography, Etc. Addison and Steele: *The Sir Roger de Coverley Papers*, or Selections from the *Tatler* and *Spectator* (about 200 pages); Boswell: Selections from the *Life of Johnson* (about 200 pages); Franklin: *Autobiography;* Irving: Selections from the *Sketch Book* (about 200 pages), or *Life of Goldsmith;* Southey: *Life of Nelson;* Lamb: Selections from the *Essays of Elia* (about 100 pages); Lockhart: Selections from the *Life of Scott* (about 200 pages); Thackeray: Lectures on *Swift*, *Addison*, and *Steele* in the *English Humorists;* Macaulay: Any one of the following essays: *Lord Clive, Warren Hastings, Milton, Addison, Goldsmith, Frederick the Great, Madame d'Arblay;* Trevelyan: Selections from the *Life of Macaulay* (about 200 pages); Ruskin: *Sesame and Lilies*, or *Selections* (about 150 pages); Dana: *Two Years before the Mast;* Lincoln: *Selections*, including at least the two *Inaugurals*, the *Speeches in Independence Hall* and *at Gettysburg*, the *Last Public Address*, the *Letter to Horace Greeley;* together with a brief memoir or estimate of Lincoln; Parkman: *The Oregon Trail;* Thoreau: *Walden;* Lowell: *Selected Essays* (about 150 pages); Holmes: *The Autocrat of the Breakfast Table;* Stevenson: *An Inland Voyage* and *Travels with a Donkey;* Huxley: *Autobiography* and selections from *Lay Sermons*, including the addresses on *Improving Natural Knowledge, A Liberal Education*, and *A Piece of Chalk;* A collection of *Essays* by Bacon, Lamb, DeQuincey, Hazlitt, Emerson, and later writers; a collection of *Letters* by various standard writers.

Group V.—Poetry. Palgrave's *Golden Treasury* (First Series), Books I and III, with special attention to Dryden, Collins, Gray, Cowper, and Burns;

Palgrave's *Golden Treasury* (First Series), Book IV, with special attention to Wordsworth, Keats, and Shelley (if not chosen for study under 3); Goldsmith: *The Traveller* and *The Deserted Village;* Pope: *The Rape of the Lock;* A collection of English and Scottish *Ballads*, as, for example, some *Robin Hood* ballads, *The Battle of Otterburn, King Estmere, Young Beichan, Bewick and Grahame, Sir Patrick Spens*, and a selection from later ballads; Coleridge: *The Ancient Mariner, Christabel*, and *Kubla Khan;* Byron: *Childe Harold*, Canto III or IV, and *The Prisoner of Chillon;* Scott: *The Lady of the Lake*, or *Marmion;* Macaulay: *The Lays of Ancient Rome, The Battle of Naseby, The Armada, Ivry;* Tennyson: *The Princess*, or *Gareth and Lynette, Lancelot and Elaine*, and *The Passing of Arthur;* Browning: *Cavalier Tunes, The Lost Leader, How They Brought the Good News from Ghent to Aix, Home Thoughts from Abroad, Home Thoughts from the Sea, Incident of the French Camp, Hervê Riel, Pheidippides, My Last Duchess, Up at a Villa—Down in the City, The Italian in England, The Patriot, The Pied Piper, "De Gustibus—," Instans Tyrannus;* Arnold: *Sohrab and Rustum*, and *The Forsaken Merman;* Selections from *American Poetry*, with special attention to Poe, Lowell, Longfellow, and Whittier.

3. An exact textual knowledge of works elected from the prescribed groups—drama, poetry, oratory, and essays.

Books to be studied: 1915-19 (one to be selected from each group).

Group I.—Drama. Shakespeare: *Julius Caesar, Macbeth, Hamlet.*

Group II.—Poetry. Milton: *L'Allegro, Il Penseroso*, and either *Comus* or *Lycidas;* Tennyson: *The Coming of Arthur, The Holy Grail*, and *The Passing of Arthur;* The selections from Wordsworth, Keats, and Shelley in Book IV of Palgrave's *Golden Treasury* (First Series).

Group III.—Oratory. Burke: *Speech on Conciliation with America;* Macaulay's Two *Speeches on Copyright* and Lincoln's *Speech at Cooper Union;* Washington's *Farewell Address* and Webster's *First Bunker Hill Oration.*

Group IV.—Essays. Carlyle: *Essay on Burns*, with a selection from Burns' *Poems;* Macaulay: *Life of Johnson;* Emerson: *Essay on Manners.*

History

English History	1 unit
American History	1 unit
Ancient History	1/2 or 1 unit
Mediaeval History	1/2 or 1 unit

Each of the above topics is intended to represent one year of historical work in which the study is given five times per week; or two years of historical work in which the study is given three times per week.

PARDEE HALL.

The examination in history will be so framed as to require comparison and the *use of judgment* on the pupil's part rather than the mere use of memory. The examinations will presuppose the use of good text-books, collateral reading, and practice in written work. Geographical knowledge will be tested by requiring the location of places and movements on an outline map.

Mathematics

Elementary Algebra including Quadratics............................ 1 1/2 units

Fundamental principles. Factoring. Fractions. Simple Equations. Involution. Evolution. Exponents. Quadratics. Equations. Simultaneous Quadratic Equations. Equations Solved as Quadratics. Properties of Quadratic Equations.

Advanced Algebra.................... 1/2 unit

Surds and Imaginaries. Simple Indeterminate Equations. Inequalities. Ratio. Proportions and Variations. Progressions.

Plane Geometry...................... 1 unit

Plane Geometry entire; as in Wentworth, Wells or Loomis.

Solid Geometry...................... 1/2 unit

Trigonometry........................ 1/2 unit

Through the solution of right and oblique triangles (Hall and Funk's *Trigonometry* or an equivalent). Candidates should bring their logarithmic tables to the examination.

Latin, Elementary........................... 3 units

(*a*) Grammar.

(*b*) Caesar's Commentaries, four books, or a portion in Nepos, Cicero's *de Senectute*, or *de Amicitia*.

(*c*) Cicero, Seven Orations.

(*d*) Prose Composition.

Latin, Advanced............................. 1 unit

(*a*) Virgil, *Aeneid*, six books, *Bucolics*.

(*b*) Prose Composition.

Greek, Elementary.......................... 2 units

(*a*) Grammar.

(*b*) Xenophon, *Anabasis*, four books or equivalent in the *Cyropaedia*.

(*c*) Prose Composition.

Greek, advanced.............................. 1 unit

(*a*) Homer, *Iliad*, three books, or *Odyssey*, three books.
(*b*) Prose Composition.

French, Elementary.......................... 2 units

(*a*) Grammar. Two-year course.
(*b*) Approved Readings. Two-year course.

This embraces a thorough knowledge of the rudiments of grammar, including the inflection of the regular and the more common irregular verbs; the inflection of nouns and adjectives for gender and number; the uses of articles and partitive constructions; the forms and positions of personal pronouns; the uses of the other pronouns. Candidates should be able to read at sight ordinary modern prose. It is believed that this ability is acquired by reading two hundred duodecimo pages from the works of at least three different authors.

French, Advanced............................ 1 unit

(*a*) Grammar and Conversation.
(*b*) Advanced Readings.

Candidates should show a thorough knowledge of accidence, and a familiarity with the essentials of French syntax, especially the uses of the tenses, modes, prepositions and conjunctions. They must be able to translate into French a connected passage of simple English, and to translate at sight standard French authors. This proficiency may be acquired by reading, in addition to that required under elementary French, not less than four hundred pages of the works of various standard authors. For examination no special authors or works are designated. Applicants should present a statement from their teachers setting forth the text-books used and the number of pages translated.

German, Elementary.......................... 2 units

(*a*) Grammar. Two-year course.
(*b*) Approved Readings. Two-year course.

At the end of the elementary course in German the student should be able to read at sight and to translate a passage of very easy dialogue or narrative prose. He should also be able to put into German short English sentences, and to answer questions upon the rudiments of grammar. He should have read at least two hundred pages of literature in the form of easy stories or plays.

German, Intermediate........................ 1 unit

(*a*) Grammar and Conversation.
(*b*) Advanced Readings.

This includes a thorough knowledge of accidence, of the elements of word-formation, and of the principal uses of the prepositions and conjunctions. The candidate should be familiar with the essentials of German syntax, and must possess the ability to translate into German easy English prose; to translate at sight passages from standard classical authors. The reading of at least three hundred and fifty pages in addition to that required under elementary German will develop such ability. For examination no specific authors or works are designated. Each candidate is required to bring a statement from his teacher, mentioning textbooks used and authors read, including the number of pages translated.

Spanish, Elementary........................ 2 units

(*a*) Grammar. Two-year course.
(*b*) Approved Readings. Two-year course.

Physics.................................. 1 unit

Chemistry................................ 1 unit

Zoölogy and Botany........................ 1 unit

Physical Geography........................ 1 unit

The work in each science should consist of recitations and of practical experiments performed in a laboratory equipped with sufficient apparatus. A neatly kept note-book with experiments recorded in the student's own words is required.

Drawing.................................. 1 unit

Either Freehand Drawing ($^1/_2$ unit) or Projection Drawing ($^1/_2$ unit) or both.

THE CURRICULUM

ARRANGEMENT OF COURSES OF STUDY

Arts and Pure Science.—Lafayette College offers three parallel courses in the liberal arts and sciences extending through four years and leading, respectively, to the degrees of Bachelor of Arts, Bachelor of Philosophy and Bachelor of Science. The course leading to the degree of Bachelor of Arts is distinguished from the course leading to the degree of Bachelor of Philosophy chiefly by the requirement of, at least, two years study of the Greek language. The curriculum leading to the degree of Bachelor of Science differs from the curriculum leading to the degree of Bachelor of Philosophy chiefly in the fact that less time is given to the study of languages and more time to the sciences and to mathematics. Any one of these three courses of study successfully completed will give the student a liberal education, and serve as a basis for professional study or for business life.

Engineering.—Lafayette College offers also five parallel technical courses in engineering extending through four years and leading, respectively, to the degrees of Bachelor of Science in Chemical Engineering, in Civil Engineering, in Electrical Engineering, in Mechanical Engineering, and in Mining Engineering. An effort has been made to keep the curriculum as nearly as possible the same in the Freshman and Sophomore years for these five groups, so as to enable the student to defer until the close of Sophomore year the choice of his special branch of Engineering. While it has not been possible to do this fully, the variations are not so great as to prevent a student who desires to change from one of these courses to another at the end of Sophomore from making up by additional work the one or two subjects in which he may be deficient. While these courses are technical and professional, the college recognizes that professional training must include as broad culture as the time at the disposal of the student will permit and makes provision, therefore, in these technical courses also for the study of English, and for electives in History, Economics, Government, Business

Law, etc. The strictly professional degree of Engineer (C. E., M. E., etc.) will be given in 1919 and thereafter only upon the completion of professional study in addition to the four years' course or for practical experience in the profession or both.

Chemistry.—Lafayette College offers also a technical course in Chemistry preparing students for the profession of Chemist. This also is a professional course with which is combined such broader cultural studies as time will permit.

Medical Preparatory.—Lafayette College offers to students preparing for the study of Medicine, a two years' course permitting intensive study of Chemistry, Physics and Biology with some study of German and such opportunity for the election of other college subjects as time will permit.

FRESHMAN AND SOPHOMORE YEARS

The work of the Freshman and Sophomore years is largely required. Greek is required of candidates for the A.B. degree. Those entering with Greek must take it for one year; those beginning Greek in college, for two years. Mathematics is required of candidates for the B.S. degree or the degrees in Engineering throughout the two years. Latin and a Modern Language are required of candidates for the degree of Ph.B., throughout the two years. In the Sophomore year, an opportunity is given to elect courses in English, Science, History, and Government. Bible is required one hour a week throughout the four years. Hygiene and Physical Training is required four times a week of all Freshmen. The curriculum of each Division is shown in the following tables. The course numbers refer to the courses as listed in the announcements of the Departments following the tables (see pages 50–88).

The tables show the number of hours per week spent in the classroom and in the laboratory, and the number of hours credit allowed in each course toward a degree.

JUNIOR AND SENIOR YEARS

THE GROUP SYSTEM IN ARTS AND PURE SCIENCE

The requirements for the Junior and Senior years are the same for all students in the liberal arts courses, *viz.*, Divisions I, II and

III. All the Departments offering courses in Divisions I, II and III in Arts and Pure Science are arranged in three groups as follows:

Group I: Language and Literature, including English.

Group II: History, Philosophy and Political Science.

Group III: Mathematics and Science.

At the end of Sophomore year each student in Divisions I, II and III must decide in which department he wishes to do the larger part of his advanced work. Each student in Division IV must decide whether to specialize in Chemical, Civil, Electrical, Mechanical or Mining Engineering.

The department selected by the student in Divisions I–III will be known as his *Major Department.* The completion of three 3-hour year courses or the equivalent in that department will constitute a *Major.* Courses designated as preliminary courses cannot be counted as part of this requirement.

The student must also, at the same time, choose two other departments, one from each of the remaining groups, as his first and second Minor Departments. The completion of two 3-hour year courses or the equivalent in one department will constitute a *Minor.* Courses designated as preliminary courses in the department cannot be counted as part of this requirement.

Of the work of the Junior and Senior years, therefore, six hours one year and three hours the second year, or *vice versa,* all taken in one department will be required to complete the *Major,* and three hours throughout the two years in one department of a different group, and three hours throughout the two years in one department of the remaining group will be required to complete the two *Minors.* In addition to the twenty-one hours thus required nine hours of electives must be completed in the two years in order to satisfy the requirements for the respective degrees. These electives may be selected from any courses open to Juniors and Seniors.

Bible one hour a week throughout the two years is required in addition of all students.

SPECIMEN JUNIOR AND SENIOR CURRICULUM

LEADING TO THE DEGREES OF A.B., PH.B., AND B.S.

Junior Year		*Senior Year*	
Major, Group I, II, III	3, $4^1/_2$ or 6	Major Group	6, $4^1/_2$ or 3
Minor, Group II, III, I	3 or 6	Minor Group	3
Minor, Group III, I, II	3 or 6	Minor Group	3
Electives	6 or 3	Electives	3, 6 or 9
Bible	1	Bible	1
Total,	16		16

DEGREES WITH DISTINCTION

Opportunity is given for students whose majors are in certain departments to win a degree with distinction. An applicant for honors must announce his candidacy at the beginning of Junior Year. In order to be eligible to such candidacy he must have secured B or higher in the courses of the Freshman and Sophomore Years. He must satisfactorily complete the additional work required by his Major Department beyond that required for his Major, and at the end of the Senior Year must pass a comprehensive examination upon the work done in the Department. He may be required also to present a thesis.

JUNIOR AND SENIOR CURRICULA IN ENGINEERING AND IN CHEMISTRY

The work of students in the technical courses in Junior and Senior years is almost entirely prescribed. The requirements are shown in detail in the tables which follow. In addition to the work of the college year students in Civil Engineering and in Chemical Engineering are required to do certain work in the summer in Sophomore and Junior years, as explained elsewhere. This work is so designed as to be of immediate practical advantage to the student, when seeking employment in his profession immediately after graduation.

RULES GOVERNING THE ELECTION OF STUDIES

1. Each student, in making his elections, must see that the courses which he desires to elect are open to his class; that he has

fulfilled the prerequisites, and that the schedule of recitations is such that there will be no conflict.

2. Elections for the second term must be filed by members of the three upper classes with the Registrar on or before January 10, and for the first term on or before May 25.

3. No student is allowed to carry more than twenty units or less than fifteen units, without the special permission of the faculty.

4. Any prescribed course in which a student has failed and which he must repeat shall be indicated upon his schedule card and shall take precedence over all other work.

5. No student will be allowed to change his electives later than two weeks after the opening of any term except by special permission of the Committee upon Attendance and Standing.

COURSES FOR THE MASTERS' DEGREES

Students wishing to pursue advanced work in certain departments may enroll as graduate students under the conditions named on page 104. The work for graduate students will be outlined by the head of the department in which the student wishes to specialize. Special facilities will be afforded in the laboratories to those wishing to pursue definite lines of investigation.

CURRICULUM OF STUDIES, FRESHMAN AND SOPHOMORE YEARS

I—LEADING TO THE DEGREE OF BACHELOR OF ARTS

First Term — Freshman Year — Second Term

		Hours per week					Hours per week		
No. of course	Subjects	Class	Lab.	Cr.	No. of course	Subjects	Class	Lab.	Cr.
Eng. 1	Composition	3		3	Eng. 2	Composition	3		3
Grk. 1 or 3	Beg. or Homer	3		3	Grk. 2 or 4	Beginners or Plato	3		3
Latin 1	Livy, etc.	3		3	Latin 2	Horace, etc.	3		3
Math. 1	Algebra	3		3	History 2	Mod. European	3		3
Chem. 1	Descriptive Chem.	1	5	3	Math. 2	Solid Geom.	2		2
Biol. 1	Gen. Biology				Math. 4	Trigonometry	1		1
Bible 1	Old testament	1		1	Bible 2	Life of Christ	1		1
Phys. Trg. and Hyg.	Lectures and Gymnasium		4	1	Phys. Trg.	Gymnasium		4	1
				17					17
Sophomore Year									
Fr. 1 or 3	Elementary or Intermediate	9		9	Fr. 2 or 4	Elementary or Advanced	9		9
Ger. 1 or 3	Elementary or Intermediate				Ger. 1 or 3	Elementary or Advanced			
Grk. 3 or 5	Homer or Drama[1]				Grk. 4 or 6	Plato or Greek Oratory[2]			
Latin 3	DeOrature—Hymns				Latin 4	De officiis—Latin Hymns			
Physics 1	General Course	3	2	3	Physics 2	General Course	3	2	3
Bible 5	Gospels in Greek	1		1	Bible 6	Gospels in Greek	1		1
	Elective	3		3		Elective	3		3
				16					16

---

[1] Required of students taking Greek 1, Freshman year.

[2] German 1 or French 1 is required if these have not been offered for entrance; otherwise German 3 or French 3 is required.

II—LEADING TO THE DEGREE OF BACHELOR OF PHILOSOPHY

First Term — Freshman Year — Second Term

		Hours per week					Hours per week		
No. of course	Subjects	Class	Lab.	Cr.	No. of course	Subjects	Class	Lab.	Cr.
Eng. 1	Composition	3		3	Eng. 2	Composition	3		3
Fr. 1 or 3	Elementary or Intermediate[1]	3		3	Fr. 2 or 4	Elementary or Advanced	3		3
Ger. 1 or 3	Elementary or Intermediate				Ger. 2 or 4	Elementary or Advanced			
Latin 1	Livy, Horace, *Odes*	3		3	Latin 2	Horace, *Epodes*, Lat., etc.	3		3
Math. 1	Algebra	3		3	Math. 2	Solid Geometry	2		2
Chem. 1	Descriptive Chem.	1	5	3	Math. 4	Trigonometry	1		1
Biol. 1	General Biol.				History 2	Modern European	3		3
Bible 1	English Bible	1		1	Bible 2	Life of Christ	1		1
Phys. Trg. and Hyg.	Health Lectures—Gymnasium		4	1	Phys. Trg.	Gymnasium		4	1
				17					17
Sophomore Year									
Fr. 1 or 3	Elementary or Intermediate	3		3	Fr. 2 or 4	Elementary or Advanced	3		3
Ger. 1 or 3	Elementary or Intermediate				Ger. 2 or 4	Elementary or Advanced			
Latin 3	De Oratore—Latin Hymns	3		3	Latin 4	Latin Hymns—De officiis	3		3
Physics 1	General Course	3	2	3	Physics 2	General Course	3	2	3
Bible 7	The Acts, in Latin	1		1	Bible 8	The Acts, in Latin	1		1
	Electives (2)	6		6		Electives (2)	6		6
				16					16

---

[1] At the end of the Sophomore year a student must have had either (*a*) three years of either French or German and one year of the other, including preparatory school work or (*b*) two years of each, including preparatory school work.

No. of course	Subjects	Hours per week Class	Hours per week Lab.	Hours per week Cr.	No. of course	Subjects	Hours per week Class	Hours per week Lab.	Hours per week Cr.
Eng. 1	Composition	3		3	Eng. 2	Composition	3		3
Fr. 1 or 3	Elementary or Intermediate[1]	3		3	Fr. 2 or 4	Elementary or Advanced	3		3
Ger. 1 or 3	Elementary or Intermediate				Ger. 2 or 4	Elementary or Advanced			
Math. 1	Algebra	3		3	Math. 2	Solid Geometry	2		2
Chem. 1	Descriptive	1	5	3	Math. 4	Trignometry	1		1
Biol. 1	General				History 2	Modern European			3
Graphics 1	Drawing, Lettering, Projection		6	2	Chem. 2	Quan. and Qual. Analysis			
Bible 1	English Bible	1		1	Biol. 4	Vertebrate Zoölogy			
					Graphics 2	Drawing, Sketch., Isometric		6	2
Phys. Trg. and Hyg.	Health Lectures—Gymnasium		4	1	Bible 2	Life of Christ	1		1
					Phys. Trg.	Gymnasium		4	1
Fr. 3	Intermediate	3		3	Fr. 4	Advanced	3		3
Ger. 3	Intermediate				Ger. 4	Advanced			
Math. 3, 5	Algebra-Trig.[2]				Math. 6	Analytics[3]			
Biol. 1	General				Chem. 2	Quan. Anal.			
Chem. 1	Descriptive				Biol. 4	Vertebrate Zoöl.			
				19					19
				Sophomore Year (B.S.)					
Fr. 3 or 21	Intermediate or Fr. Hist.	3		3	Fr. 4 or 22	Advanced or French Novel	3		3
Ger. 3 or 11	Interm. or XIX Cent. writers				Ger 4 or 12	Adv. or XIX Cent. writers			
Math. 7	Trigonometry (Cont. of 4)	3		3	Math. 10	Analytics	3		3
Physics 1	General	3	4	3	Physics 2	General	3	4	3
Bible 3	The Gospels	1		1	Bible 4	The Gospels	1		1
	Electives	6		6		Electives	6		6
				16					16

---

[1] At the end of the Sophomore year, students must have had two years of French and two years of German, including preparatory school work.

[2] If Mathematics 3 and 5 are scheduled Math. 1 is omitted.

[3] If Mathematics 6 is scheduled, Math. 4 is omitted.

IV—LEADING TO THE DEGREE OF BACHELOR OF SCIENCE IN CHEMICAL, CIVIL, ELECTRICAL, MECHANICAL OR MINING, ENGINEERING

Freshman Year

First Term					Second Term				
		Hours per week					Hours per week		
No. of course	Subjects	Class	Lab.	Cr.	No. of course	Subjects	Class	Lab.	Cr.
Eng. 1	Composition	3		3	Eng. 2	Composition	3		3
Fr. 1 or 3	Elementary or Intermediate[1]	3		3	Fr. 2 or 4	Elementary or Advanced	3		3
Ger. 1 or 3	Elementary or Intermediate				Ger. 2 or 4	Elementary or Advanced			
Chem. 1	Descriptive	1	5	3	Chem. 2	Quan. and Qual. Anal.	1	5	3
Graphics 1	Drawing, Lettering, Projection		6	2	Chem. 2*b*	Adv. Quan. Anal.[7]		6	2
Math. 3	Algebra	4		4	Graphics 2	Drawing, Sketch., Isometric		6	2
Math. 5	Trigonometry	2		2	Math. 6	Analytical Geometry	3		3
Bible 1	English Bible	1		1	Math. 8	Laboratory Mathematics		2	1
Phys. Trg.					C.E. 2	Plane Surveying[2]		6	2
and Hyg.	Health Lectures—Gymnasium	4		1	Bible 2	Life of Christ	1		1
				—	Phys. Trg.	Gymnasium		4	1
				19					—
									21

Sophomore Year (Engineering)

Eng. 3	English Literature	3		3	Math. 12	Integral Calculus	3		3
Math. 11	Differential Calculus	3		3	Physics 4	General	3	4	4
Physics 3	General	3	4	4	Physics 6	Electricity[6]	2		2
Physics 5	Electricity[6]		4	2	Graph. 4	Des. Geom.—Mach. Drawing	1	4	3
Graph. 3	Descriptive Geometry	2	2	3	C.E. 4	Railroads[4]			2
C.E. 3	Topographical Surveying			2	M.E. 2	Forging, etc.			2
M.E. 1	Pattern Making, etc.			2	Chem. 4	Organic Chemistry[5]			2
Chem. 3	Qualitative Analysis[3]			2		Elec. from Group I or II	2 or 3		2 or 3
Bible 3	The Gospels	1		1	Bible 4	The Gospels	1		1
				—					—
				22					21
									or
									22

[1] If only German is offered for entrance, either French 1 or German 3 is required. If only French is offered for entrance, either German 1 or French 3 is required, as the student may elect.

[2] Not required of Mining Engineers.

[3] Not required of Civil Engineers.

[4] Required of Civil Engineers only.

[5] Required of Chemical and Mining Engineers only.

[6] Required of Electrical Engineers and Mechanical Engineers only.

[7] Required of Mining Engineers only.

V A—LEADING TO THE DEGREE OF BACHELOR OF SCIENCE IN CHEMISTRY

Freshman Year

First Term					Second Term				
		Hours per week					Hours per week		
No. of course	Subjects	Class	Lab.	Cr.	No. of course	Subjects	Class	Lab.	Cr.
Eng. 1	Composition	3		3	Eng. 2	Composition	3		3
Fr. 1 or 3	Elementary or Intermediate	3		3	Fr. 2 or 4	Elementary or Advanced	3		3
Ger. 1 or 2	Elementary or Intermediate				Ger. 2 or 4	Elementary or Advanced			
Chem. 1	Descriptive	1	4	3	Chem. 2	Quan. and Qual. Analysis	1	4	3
Graph. 1	Drawing, Lettering, Projection			2	Graph. 2	Drawing, Sketch., Isometric		6	2
Math. 3	Algebra	4		4	Math. 4	Trigonometry	4		4
Math. 5	Trigonometry	2		2	C.E. 2	Surveying	2		2
Bible 1	Old Testament	1		1	Bible 2	Life of Christ	1		1
Phys. Trg. and Hyg.	Health Lectures—Gymnasium		4	1	Phys. Trg.	Gymnasium		4	1
				19					19

Sophomore Year

No. of course	Subjects	Class	Lab.	Cr.	No. of course	Subjects	Class	Lab.	Cr.
Eng. 3	English Literature	3		3	Chem. 4	Organic Chemistry	1	2	2
Chem. 3	Qualitative Analysis	1	2	2	Math. 8	Integral Calculus	4		4
Math. 7	Differential Calculus	3		3	Physics 4	General	2	4	4
Physics 3	General	2	4	4		Elective			3
	Elective			3	M.E. 2	Shop			2
M.E. 1	Shop			2	Bible 4	The Gospels	1		1
Bible 3	The Gospels	1		1		Elec. from Group I or II	2 or 3		2 or 3
				18					18

V B—Pre-Medical Course

Freshman Year

First Term					Second Term				
		Hours per week					Hours per week		
No. of course	Subjects	Class	Lab.	Cr.	No. of course	Subjects	Class	Lab.	Cr.
Eng. 1	Composition	3		3	Eng. 2	Composition	3		3
Ger. 1 or 3	Elementary or Intermediate[1]	3		3	Ger. 2 or 4	Elementary or Advanced	3		3
Chem. 1	Descriptive	1	5	3	Chem. 2	Quan. and Qual. Analysis	1	5	3
Math. 1	Algebra	3		3	Math. 2	Solid Geometry	2		2
Biol. 1	General	1	5	3	Math. 4	Trigonometry	1		1
Bible 1	English Bible	1		1	Biol. 4	Vertebrate Zoölogy	1	5	3
	Elective	3			Bible 2	Life of Christ	1		1
						Elective	3		
Phys. Trg. and Hyg.	Health Lectures—Gymnasium		4	1	Phys. Trg.	Gymnasium		4	1
				17					17
Sophomore Year									
Biol. 5 or 7	Physiol. or Invert. Zoöl.	1	5	3	Biol. 2	Bacteriology	1	5	3
Biol. 3	Botany	1	5	3	Biol. 6	Embryology	1	5	3
Chem.	Qualitative			5	Chem.	Organic			5
Physics 1	General	3	4	3	Physics 2	General	3	4	3
Bible 3	The Gospels	1		1	Bible 4	The Gospels	1		1
	Elective			3		Elective			3
				18					18

---

[1] If two or more units of German are offered for entrance, German 3 is required.

CHEMICAL ENGINEERING

Junior Year

First Term 1916–17		Hours per week			Second Term 1915–16		Hours per week		
No. of course	Subjects	Class	Lab.	Cr.	No. of course	Subjects	Class	Lab.	Cr.
Chem. 5	Quantitative Analysis			2	Chem. 4	Organic Chemistry	1	3	2
Chem. 7	Theoretical Chemistry	2		2	Chem. 6	Quantitative Analysis	2	8	6
Chem. 9	Chemical Arithmetic	2		2	Chem.12	Metallurgy	2	4	2
Chem. 11	Metallurgy	2	4	2	C.E. 10	Mechanics of Materials	3		3
C.E. 7	Applied Mechanics	3		3	E.E. 6	Motor and Ill. Eng.	1	3	2
C.E. 9	Mechanics of Materials	3		3	M.E. 8	Heat Engineering	3		3
E.E. 5	Elements of E.E.	2		2	Bible 10	New Testament	1		1
M. E. 7	Heat Engineering	3		3					—
Bible 9	New Testament	1		1					19
				—					
				20					

Senior Year

No. of course	Subjects	Class	Lab.	Cr.	No. of course	Subjects	Class	Lab.	Cr.
Chem. 15	Organic Chemistry	1	3	2	Chem. 18	Chem. Technology	3		3
Chem. 17	Chemical Engineering	3		3	Chem. 24	Thesis		9	3
Chem. 21	Assaying		6	2	Chem.	Hydro and Elec. Metal.			2
Chem. 23	Quantitative Analysis	1	4	2	Biol. 10	Sanitary Biology	1	4	3
C.E. 11	Cement	2		2	C.E. 24	Hydraulics	2		2
C.E. 23	Hydraulics	2		2	M.E. 12	Industrial Management	2		2
E.E. 13	Electrical Design		4	2	Geol. 12	Geology of Ore Deposits	2		2
Geology 9	Field and Econ. Geology		6	2	Geol. 14	Petrography		6	2
Geology 13	Systematic Mineralogy		6	2	Bible 16	Church History	1		1
Bible 15	History of English Bible	1		1					—
				—					20

First Term 1916–17 Junior Year Second Term 1915–16

		Hours per week					Hours per week		
No. of course	Subjects	Class	Lab.	Cr.	No. of course	Subjects	Class	Lab.	Cr.
C.E. 5	Railroads	1	4	3	C.E. 6	Geodesy	2	2	2
C.E. 7	Applied Mechanics	3		3	C.E 8–32	Roads and Pavements	2		2
C.E. 9	Mechanics of Materials	3		3	C.E. 10	Mechanics of Materials	3		3
C.E. 11	Cement	2		2	C.E. 12	Masonry	2		2
C.E. 29	General Testing Lab.		3	1	C.E. 14	Framed Structures	2		2
C.E. 31	Cement Laboratory		3	1	C.E. 20–34	Hydraulics	2	2	2
E.E. 5	Elements of Elec. Eng.	2		2	C.E. 30	General Testing Lab.		3	1
E.E. 9	Electrical Laboratory		3	1	Biol. 10	Sanitary Biology	1	4	3
Geol. 7	General Geology		4	2	Geol. 8	General Geology	2		2
Bible 9	New Testament	1		1	Bible 10	New Testament	1		1
	Total			19					20
				Senior Year					
C.E. 13	Masonry Design		6	2	C.E. 18	Sewerage Design		4	2
C.E. 15	Framed Structures	3	6	6	C.E. 26	Water Supply Design		2	1
C.E. 17	Sewerage	2		2	C.E. 16	Framed Structures	3	9	9
C.E. 21	Hydraulics	2		2	C.E. 36	Thesis		6	2
C.E. 25	Water Supplies	2		2	Group I or II	Elective	2		2
C.E. 27	Reinforced Concrete	1	2	2	Law 10	Business Law	2		2
Econ. 3	Business Corporations	2		2	Bible 16	Church History	1		1
Bible 15	History of English Bible	1		1					
				19					19

ELECTRICAL ENGINEERING

Junior Year

First Term 1916–17					Second Term 1915–16				
		Hours per week					Hours per week		
No. of course	Subjects	Class	Lab.	Cr.	No. of course	Subjects	Class	Lab.	Cr.
E.E. 1	Alternating Cur. Eng.	3		3	E.E. 4	Electrical Laboratory		6	2
E.E. 3	Electrical Laboratory		6	2	E.E. 6	Motor and Illum. Eng.	3		3
E.E. 21	Engineering Abstracts	2		1	E.E. 12	Electrical Problems	2		2
C.E. 7	Applied Mechanics	3		3	E.E. 22	Engineering Abstracts	2		1
C.E. 9	Mechanics of Materials	3		3	C.E. 10	Mechanics of Materials	3		3
C.E. 29	General Testing Lab.		3	1	C.E. 30	General Testing Lab.		3	1
M.E. 1	Shop		6	2	M.E. 2	Shop		6	2
M.E. 9	Heat Engineering	3		3	M.E. 10	Heat Engineering	3		3
Bible 9	The New Testament	1		1	Bible 10	The New Testament	1		1
				19					18

Senior Year

No. of course	Subjects	Class	Lab.	Cr.	No. of course	Subjects	Class	Lab.	Cr.
E.E. 7	Electrical Laboratory		6	2	E.E. 8	Electrical Laboratory		6	2
E.E. 11	Electrical Power Trans.	5		5	E.E. 16	Elec. Power Plant Eng.	4		4
E.E. 13	Electrical Design		4	2	E.E. 22	Engineering Abstracts	2		1
E.E. 14	Electric Railway Eng.	3		3	E.E. 24	Thesis		6	2
E.E. 21	Engineering Abstracts	2		1	E.E. 18	Telephones*			
C.E. 23	Hydraulics	2		2	E.E. 20	Storage Battery Eng.*	3		3
Econ. 3	Business Corporations	2		2	C.E. 24	Hydraulics	2		2
Bible 15	History of English Bible	1		1	Law 10	Business Law	3		3
					Bible 16	Church History	1		1
				18					18

* Elect one of two.

MECHANICAL ENGINEERING

Junior Year

First Term 1916–17					Second Term 1915–16				
		Hours per week					Hours per week		
No. of course	Subjects	Class	Lab.	Cr.	No. of course	Subjects	Class	Lab.	Cr.
M.E.1	Shop		6	2	M.E. 2	Shop		6	2
M.E. 5	Heat Engineering	3		3	M.E. 6	Heat Engineering	3		3
Biol. 9	Sanitary Biology	1	4	3	M.E. 14	Boiler Design		3	1
C.E. 7	Applied Mechanics	3		3	Chem. 12	Metallurgy		6	2
C.E. 9	Mechanics of Materials	3		3	C.E. 10	Mechanics of Materials	3		3
C.E. 29	General Testing Lab.		3	1	C.E. 30	General Testing Lab.		3	1
E.E. 5	Elements of Elec. Eng.	2		2	E.E. 6	Motor and Illum. Eng.	2	3	3
E.E. 9	Electrical Laboratory		3	1	E.E. 10	Electrical Engineering		3	1
Bible 9	New Testament	1		1	Bible 10	New Testament	1		1
				19					17

Senior Year

No. of course	Subjects	Class	Lab.	Cr.	No. of course	Subjects	Class	Lab.	Cr.
M.E. 7	Heat Engineering	3		3	M.E. 8	Heat Engineering	3		3
M.E. 11	Machine Design	1	4	3	M.E. 12	Machine Design		9	3
C.E. 15*a*	Framed Structures	2		2	M.E. 14	Industrial Management	2		2
C.E. 23	Hydraulics	2		2	M.E. 18	Thesis		6	2
Econ. 3	Business Corporations	2		2	E.E. 16	Power Plants	2		2
E.E. 11	Power Transmission	3		3	Group I or II	Elective	3		3
Bible 15	History of English Bible	1		1	Law 10	Business Law	2		2
					Bible 16	Church History	1		1
				16					18

MINING ENGINEERING

Junior Year

First Term 1916–17					Second Term 1915–16				
		Hours per week					Hours per week		
No. of course	Subjects	Class	Lab.	Cr.	No. of course	Subjects	Class	Lab.	Cr.
Chem. 11	Metallurgy		6	2	Chem. 12	Metallurgy		6	2
C.E. 7	Applied Mechanics	3		3	E.M. 4	Ore Dressing	2		3
C.E. 9	Mechanical of Materials	3		3	C.E. 10	Mechanics of Materials	3		3
C.E. 29	General Testing Lab.		3	1	C.E. 30	General Testing Lab.		3	1
E.E. 5	Elements of Elec. Eng.	2	3	3	E.E. 6	Motor and Illum. Eng.	3		3
Geol. 7	General Geology		4	2	Geol. 8	General Geology		4	2
M.E. 7	Heat Engineering	3		3	M.E. 8	Heat Engineering	3		3
Bible 9	New Testament	1		1	Bible 10	New Testament	1		1
				18					18
				Senior Year					
E.M. 1	Mine Structures		6	2	E.M. 2	Mine Structures		6	2
E.M. 3	Mine Exploitation	2		2	E.M. 4	Ore Dressing	3		3
E.M. 5	Mine Machinery	2		2	E.M. 6	Shaft Sinking	2		2
Chem. 21	Assaying		6	2	E.M. 8	Ventilation	2		2
C.E. 23	Hydraulics	2		2	E.M. 10	Mining Law	2		2
Econ. 3	Business Corporations	2		2	E.M. 12	Thesis		3	1
Geol. 9	Field Geology		6	2	Geol. 12	Ore Deposits	2		2
Geol. 11	Ore Deposits	2		2	Geol. 14	Petrography		6	2
Geol. 13	Mineralogy		6	2	Bible 16	Church History	1		1
Bible 15	History of English Bible	1		1					
				19					17

TO THE DEGREE OF BACHELOR OF SCIENCE IN CHEMISTRY

Junior Year

First Term 1916–17		Hours per week			Second Term 1915–16		Hours per week		
No. of course	Subjects	Class	Lab.	Cr.	No. of course	Subjects	Class	Lab.	Cr.
Chem. 5	Quantitative Analysis	1	6	3	Chem. 6	Quantitative Analysis	2	10	6
Chem. 7	Theoretical Chemistry	2		2	Chem. 8	Theoretical Chemistry	2		2
Chem. 9	Chemical Arithmetic	2		2	Chem. 12	Metallurgy	2	4	2
Chem. 11	Metallurgy	2	4	2	Chem. 14	Chemical German	1		1
Chem. 13	Chemical German	1		1	Chem. 16	Org. and Inorg. Prep.	2	4	4
Chem. 15	Organic Chemistry	2	3	3	Geology 8	General Geology			2
Biology 9	Sanitary Biology	1		3	Bible 10	New Testament	1		1
Geology 7	General Geology			2					—
Bible 9	New Testament	1		1					18
				—					
				19					

Senior Year

No. of course	Subjects	Class	Lab.	Cr.	No. of course	Subjects	Class	Lab.	Cr.
Chem. 17	Chemical Engineering	3		3	Chem. 18	Chemical Technology	3		3
Chem. 19	Chemical German	1		1	Chem. 20	Chemical German	1		1
Chem. 21	Assaying		6	2	Chem. 24	Thesis		15	6
Chem. 23	Quantitative Analysis	1	8	4	Theol. 12	Geology of Ore Deposits	2		2
Chem. 25	Org. and Inorg. Preps.		4	2	Geol. 14	Petrography		6	2
Geology 9	Field and Econ. Geology		6	2	GroupIorII	Elective	2 or 3		2 or 3
Geology 11	Geology of Ore Deposits	2		2	M. E. 12	Industrial Management	2		2
Geology 13	Systematic Mineralogy		6	2	Bible 16	Church History	1		1
Bible 15	History of English Bible	1		1					—
				—					19
				19					or
									20

SCHEDULE FOR FRESHMAN AND SOPHOMORE CLASSES, ARTS AND

HR.	MONDAY	TUESDAY	WEDNESDAY
8	Latin 1, 2 (A.B. and Sect. A of Ph.B.) Mathematics 1, 2, 4 (Sect. B) Mathematics 3, 5, 6 (Sect. A), 12 Mech. Eng. 3, 4 Physics 1, 2 (Quiz, Sect. A)	Latin 1, 2 (A.B. and Sect. A of Ph.B.) Mathematics 1, 2, 4 (Sect. B) Mathematics 3, 5, 6 (Sect. A), 12 Mech. Eng. 3, 4 Physics 1, 2 (Quiz, Sect. B)	Bible 5, 6 (A.B.) Bible 7, 8 (Ph.B.) Latin 1, 2 (A.B. and Sect. A of Ph.B.) Mathematics 1, 2, 4 (Sect. B), 3, 5, 6 (Sect. A) Physics 1, 2 (Lab. B.S., M.P.) Physics 3, 4 (Quiz)
9	Civ. Eng. 33 (elective) English 1, 2 (A.B., B.S., M.P.) Mathematics 3, 5, 6 (Sect. B) Mech. Eng. 3, 4 Physics 1, 2 (Lecture)	Civ. Eng. 33 (elective) English 1, 2 (A.B., B.S., M.P.) Mathematics 3, 5, 6 (Sect. B) Mech. Eng. 3, 4 Physics 1, 2 (Lecture)	Civ. Eng. 33 (elective) English 1, 2 (A.B., B.S., M.P.) Mathematics 3, 5, 6 (Sect. B) Physics 1, 2 (Lab. B.S., M.P.) Physics 3, 4 (Lecture)
10	Chemistry 1, 2 (B.S. in Chem.) French 1, 2, 3 Economics 2 German 1, 2, 3, 4 (Sect. C) Government 3 (elect.) Graphics 1, 2 (B.S.) Greek 1, 2 Mathematics 11	Chemistry 1, 2 (B.S. in Chem.) Economics 2 French 1, 2, 3 German 1, 2, 3, 4 (Sect. C) Government 3 (elect.) Graphics 1, 2 (B.S.) Greek 1, 2 Mathematics 11	Chemistry 1, 2 (B.S. in Chem.) Economics 2 French 1, 2, 3 German 1, 2, 3, 4 (Sect. C) Government 3 (elect.) Graphics 1, 2 (B.S.) Greek 1, 2 Mathematics 11, 12
11	Chemistry 1, 2 (B.S. in Chem.) Graphics 1, 2 (B.S.) History 2, 3 (Sect. A) (elect.) Mathematics 7, 10 Physical Train'g 3, 4 Sociology 2 (Sect. B)	Chemistry 1, 2 (B.S. in Chem.) Graphics 1, 2 (B.S.) History 2, 3 (Sect. A) (elect.) Mathematics 7, 10 Physical Training 3, 4 Sociology 2 (Sect. B)	Chemistry 1, 2 (B.S. in Chem.) Graphics 1, 2 (B.S.) History 2, 3 (Sect. A) (elect.) Mathematics 7, 10 Sociology 2 (Sect. B)
1	Biology 1, 2, 3, 6 Chemistry 3, 4 (B.S. in Chem.) English 1, 2 (Ph.B.) Graphics 1, 2 (B.S. in Chem.)	Biology 1, 2, 3, 6 Chemistry 3, 4 (B.S. in Chem.) English 1, 2 (Ph.B.) Graphics 1, 2 (B.S. in Chem.) Greek 5, 6 (elective)	Public Lectures and student organization meetings
2	Biology 1, 2, 3, 6 Chemistry 3, 4 (B.S. in Chem.) Graphics 1, 2 (B.S. in Chem.) Greek 3, 4 Latin 1, 2 (Sect. B of Ph.B.) Physics 1, 2 (Lab. A.B., Ph.B., Sect. B)	Biology 1, 2, 3, 6 Chemistry 3, 4 (B.S. in Chem.) Graphics 1, 2 (B.S. in Chem.) Greek 3, 4 Latin 1, 2 (Sect. B of Ph.B.) Physics 1, 2 (Lab. A.B., Ph.B., Sect. B)	Bible 1, 2 Bible 3, 4 (B.S., M.P., B.S. in Chem.)
3	Biology 1, 2, 3, 6 Chemistry 3, 4 (B.S. in Chem.) Graphics 1, 2 (B.S. in Chem.) Physics 1, 2 (Lab. A.B., Ph.B., Sect. B)	Biology 1, 2, 3, 6 Chemistry 3, 4 (B.S. in Chem.) Graphics 1, 2 (B.S. in Chem.) Physics 1, 2 (Lab. A.B., Ph.B., Sect. B)	
4	PhysicalTrain'g 1,3,4	Physical Training 1, 3, 4	

SCIENCE COURSES, 2ND TERM 1915–16, 1ST TERM 1916–17

THURSDAY	FRIDAY	SATURDAY
French 1, 2, 3, 4 German 1, 2, 3, 4 (Section A) Mathematics 1, 2, 4 (Sect. A) Physics 1, 2 (Lab. B.S., M.P.) 3, 4 (Quiz)	Chemistry 3, 4 French 1, 2, 3, 4 German 1, 2, 3, 4 (Section A) Mathematics 1, 2, 4 (Sect. A) Physics 1, 2 (Lab. A.B., Ph.B., Sect. A)	Chemistry 3, 4 French 1, 2, 3, 4 German 1, 2, 3, 4 (Section A) Mathematics 1, 2, 4 (Sect. A) Physics 1, 2 (Lab. A.B., Ph.B., Sect. A)
French 1, 2, 3 German 1, 2, 3 (Section B) 11, 12 Government 2 Greek 1, 2 Physics 1, 2 (Lab. B.S., M.P.), 3, 4 (Lect.)	Chemistry 3, 4 French 1, 2, 3 German 1, 2, 3 (Section B), 11, 12 Government 2 Greek 1, 2 Physics 1, 2 (Lab. A.B., Ph.B., Sect. A)	Chemistry 3, 4 French 1, 2, 3 German 1, 2, 3 (Section B) 11, 12 Government 2 Greek 1–2 Physics 1, 2 (Lab. A.B., Ph.B., Sect. A)
Chemistry 1, 2, 3, 4 English 3 English 5, 6 (elective) History 4, 5 (elective) Mathematics 3, 5 (Sect. A) Mathematics 8 (Sect. A) Mathematics 12	Chemistry 1, 2, 3, 4 English 3 English 5, 6 (elective) History 4, 5 (elective) Mathematics 3, 5 (Sect. A) Mathematics 8 (Sect. B)	Chemistry 1, 2, 3, 4 English 3 English 5, 6 (elective) History 4, 5 (elective) Mathematics 3, 5 (Sect. A)
Chemistry 1, 2, 3, 4 Latin 3, 4 History 2 (Sect. B) Mathematics 3, 5 (Sect. B) Mathematics 8 (Sect. A) Philosophy, 3, 4 (elective) Physical Training 3, 4 Sociology 1, 2 (elective)	Chemistry 1, 2, 3, 4 History 2 (Sect. B) Latin 3, 4 Mathematics 3, 5 (Sect. B) Mathematics 8 (Sect. B) Philosophy 3, 4 (elective) Physical Training 3, 4 Sociology 1, 2 (elective)	Chemistry 1, 2, 3, 4 History 2 (Sect. B) Latin 3, 4 Mathematics 3, 5 (Sect. B) Philosophy 3, 4 (elective) Sociology 1, 2 (elective)
Biology 1, 4, 5, 7 Civ. Eng. 2 English 1, 2 (Ph.B.) Greek 5, 6 (elective)	Biology 1, 4, 5, 7 Civ. Eng. 2 Greek 5, 6 (elective)	
Biology 1, 4, 5, 7 Civ. Eng. 2 Greek 3, 4 Latin, 1, 2 (Sect. B of Ph.B.) Physics 1, 2 (Lab. A.B., Ph.B., Sect. C), 3, 4 (Lab.)	Bible 1, 2 Biology 1, 4, 5, 7 Civ. Eng. 2 Greek 3, 4 Physics 1, 2 (Lab. A.B., Ph.B., Sect. C), 3, 4 (Lab.)	
Biology 1, 4, 5, 7 Civ. Eng. 2 Physics 1, 2 (Lab. A.B., Ph.B., Sect. C), 3, 4 (Lab.)	Biology 1, 4, 5, 7 Civ. Eng. 2 Physics 1, 2 (Lab. A.B., Ph.B., Sect. C), 3, 4 (Lab.)	
Physical Training 1, 3, 4	Physical Training 1, 3, 4	

SCHEDULE FOR JUNIOR AND SENIOR CLASSES, ARTS AND

HR.	MONDAY	TUESDAY	WEDNESDAY
8	Chemistry 15, 16, 23 English 11, 12 Geology 11, 12 German 21, 22, 23 Greek 13, 14 History 7, 8, 9, 10 Spanish 1, 2	Chemistry 15, 16, 23 English 11, 12 Geology 11, 12 German 21, 22, 23 Greek 13, 14 History 7, 8, 9, 10 Spanish 1, 2	Chemistry 9, 16, 17, 24 English 11, 12 German 21, 22, 23 Greek 13, 14 History 7, 8, 9, 10 Spanish 1, 2
9	Chemistry 7, 8, 23, 24 Civ. Eng. 33 Economics 4, 5 English 7, 8 French 23, 24 Geology 1, 2 Greek 15 Philosophy 10	Chemistry 7, 8, 23 Civ. Eng. 33 Economics 4, 5 English 7, 8 French 23, 24 Geology 1, 2 Greek 15 Philosophy 10	Chemistry 15, 16, 23, 24 Civ. Eng. 33 Economics 4 English 7, 8 French 23, 24 Geology 1, 2 Greek 15 Philosophy 10
10	Chemistry 23, 24, 27 Chemistry 28, 31, 32 Economics 2 Geology 7, 8 Government 3 Latin 7, 8 Physics 9, 18, 20	Chemistry 23, 27, 28 Chemistry 31, 32 Economics 2 Geology 7, 8 Government 3 Latin 7, 8 Physics 9, 18, 20	Chemistry 15, 16, 23, 24 Chemistry 31, 32 Economics 2 Government 3 Latin 7, 8 Physics 9, 18, 20
11	Chemistry 23, 27, 28 Chemistry 31, 32 English 17, 18 Geology 7, 8 German 8 Greek 7, 8 History 2, 3, 11 Mathematics 7, 10 Spanish 3, 4	Chemistry 23, 27, 28 Chemistry 31, 32 English 17, 18 Geology 7, 8 German 8 Greek 7, 8 History 2, 3, 11 Mathematics 7, 10 Physics 9, 18, 20 Spanish 3, 4	Chemistry 15, 16, 23, 24 Chemistry 31, 32 English 17, 18 German 8 Greek 7, 8 History 2, 3, 11 Mathematics 7, 10 Physics 9, 18, 20 Spanish 3, 4
1	Bible 9, 10, 11, 12, 13, 14 Biology 1, 2, 3 Chemistry 11, 12, 24 Geology 13	Biology 1, 2, 3 Chemistry 11, 12, 24 Education 11, 12 English 20 Geology 13 Greek 5, 6 Mathematics 17, 18	Public Lectures and student organization meetings
2	Bible 15, 18 Biology 1, 2, 3 Chemistry 11, 12, 24 Geology 13 Physics 11, 12	Biology 1, 2, 3 Chemistry 11, 12, 24 Geology 13 Law 5 Mathematics 15, 16 Philosophy 5, 6, 8 Physics 11, 12	Bible 9, 10, 11, 12, 13 14, 15, 18
3	Biology 1, 2, 3 Chemistry 11, 12, 24 Geology 13 Greek 9, 10 Physics 11, 12	Biology 1, 2, 3 Chemistry 11, 12, 24 Geology 13 Greek 9, 10 Physics 11, 12	

SCIENCE COURSES, 2ND TERM 1915–16, 1ST TERM 1916–17

THURSDAY	FRIDAY	SATURDAY
Chemistry 9, 6, 17, 18 English 9, 10 Geology 5, 6 Law 9, 10	Chemistry 5, 6, 17, 18 Chemistry 29, 30, 33, 34 English 9, 10 Geology 5, 6 Law 9, 10	Chemistry 29, 30, 33, 34 Chemistry 6, 17, 18 English 9, 10 Geology 5, 6, 9 Law 9, 10
Chemistry 6, 21, 24 English 25 Geology 5, 6 German 11, 12 Government 2 Latin 5, 6 Mathematics 13, 14	Chemistry 13, 19 Chemistry 12 (Mech.) Chemistry 29, 30, 33, 34 English 25 Geology 5, 6 German 11, 12 Government 2 Latin 5, 6 Mathematics 13, 14	Chemistry 29, 30, 33, 34 Chemistry 12 (Mech.) English 25 Geology 5, 6, 9 German 11, 12 Government 2 Latin 5, 6 Mathematics 13, 14 Mech. Eng. 14
Biology 7, 8 Chemistry 6, 21, 24, Chemistry 31, 32 English 5, 6 French 21, 22 Geology 3, 4 Greek 11, 12 History 4, 5 Philosophy 1 Physics 7, 8	Biology 7, 8 Chemistry 25, 31, 32 Chemistry 12 (Mech.) English 5, 6 French 21, 22 Geology 3, 4 Greek 11, 12 History 4, 5 Philosophy 1 Physics 7, 8	Biology 7, 8 Chemistry 24, 25, 31, 32 Chemistry 12 (Mech.) English 5, 6 French 21, 22 Geology 3, 4 Greek 11, 12 History 4, 5 Philosophy 1 Physics 7, 8
Biology 7, 8 Chemistry 6, 21, 24 Chemistry 31, 32 English 15, 16 Geology 3, 4 Greek 17 Italian 1, 2 Philosophy 2, 3 Sociology 1, 2	Biology 7, 8 Chemistry 14, 20, 25, 30, 32, 12 (Mech.) English 15, 16 Geology 3, 4 Greek 17 Italian 1, 2 Philosophy 2, 3 Physics 7, 8 Sociology 1, 2	Biology 7, 8 Chemistry 24, 25, 31, 32 Chemistry 12 (Mech.) English 15, 16 Geology 3, 4 Greek 17 Italian 1, 2 Philosophy 2, 3 Physics 7, 8 Sociology 1, 2
Biology 1, 4, 5, 6 Chemistry 5, 6, 21 Education 11, 12 English 20 Geology 14 Greek 5, 6 Mathematics 17, 18	Biology 1, 4, 5, 6 Chemistry 5, 6, 23 Education 11, 12 English 20 Geology 9, 14 Greek 5, 6 Mathematics 17, 18	
Biology 1, 4, 5, 6 Chemistry 5, 6, 21 Geology 14 Law 5 Mathematics 15, 16 Philosophy 5, 6, 8	Biology 1, 4, 5, 6 Chemistry 5, 6, 23 Geology 9, 14 Law 5 Mathematics 15, 16 Philosophy 5, 6, 8	
Biology 1, 4, 5, 6 Chemistry 5, 6, 21 Geology 14 Greek 9, 10	Biology 1, 4, 5, 6 Chemistry 5, 6, 23 Geology 9, 14	

SCHEDULE FOR FRESHMAN AND SOPHOMORE CLASSES, TECH-

HR.	MONDAY	TUESDAY	WEDNESDAY
8	French 1, 2 (Sect. B) Mathematics 3, 5, 6 (Sect. A), 12 (Civ.) Physics 3 Lab. (Min., Elec., Mech.) German 4	French 1, 2 (Sect. B) Mathematics 3, 5, 6 (Sect. A), 12 (Civ.) Physics 3 (Lab. Min., Elec., Mech.) German 4	French 1, 2 (Sect. B) Mathematics 3, 5, 6 (Sect. A) Physics 3, 4 (Quiz) German 4
9	French 1, 2 (Sect. A) Mathematics 3, 5, 6 (Sect. B) Physics 3, 4 Lab. (Min., Elec., Mech.) Civ. Eng. 4 German 4	French 1, 2 (Sect. A) Mathematics 3, 5, 6 (Sect. B) Physics 3, 4 (Lab. Min., Elec., Mech.) Civ. Eng. 4 German 4	French 1, 2 (Sect. A) Mathematics 3, 5, 6 (Sect. B) Physics 3, 4 (Lecture) German 4
10	Chemistry 1, 2 Mathematics 11, 12 Civ. Eng. 4	Chemistry 1, 2 Mathematics 11, 12 Civ. Eng. 4	Chemistry 1, 2 Mathematics 11, 12
11	Chemistry 1, 2 Civ. Eng. 4 Sociology 2 (Elect). Physical Training 3, 4	Chemistry 1, 2 Graphics 3 (Min. Elec., Mech.) Civ. Eng. 4 Physical Training 3, 4	Chemistry 1, 2 Graphics 3, 4 (Civ.) Sociology 2 (Elect.)
1	Chemistry 3 (Mech.) Civ. Eng. 3 (Sect. B) Graphics 1, 2 (B.S. in Chem.) Mech. Eng. 1, 2 (Elec. Min.) Surveying 2 (B.S. in Eng.)	Chemistry 3 (Mech.) Civ. Eng. 3 (Sect. B) Graphics 1, 2 (B.S. in Chem.) Mech. Eng. 1, 2 (Elec. Min.) Surveying 2 (B.S. in Eng.)	Public Lectures and student organization meetings
2	Chemistry 3 (Mech.) Civ. Eng. 3 (Sect. B) Graphics 1, 2 (B.S. in Chem.) Mech. Eng. 1, 2 (Elec. Min.) Physics 3, 4 (Lab., Civ.) Surveying 2 (B.S. in Eng.)	Chemistry 3 (Mech.) Civ. Eng. 3 (Sect. B) Graphics 1, 2 (B.S. in Chem.) Mech. Eng. 1, 2 (Elec. Min.) Physics 3, 4 (Lab., Civ.) Surveying 2 (B.S. in Eng.)	Bible 1, 2, 3, 4
3	Chemistry 3 (Mech.) Civ. Eng. 3 (Sect. B) Graphics 1, 2 (B.S. in Chem.) Mech. Eng. 1, 2 (Elec. Min.) Physics 3, 4 (Lab., Civ.) Surveying 2 (B.S. in Eng.)	Chemistry 3 (Mech.) Civ. Eng. 3 (Sect. B) Graphics 1, 2 (B.S. in Chem.) Mech. Eng. 1, 2 (Elec. Min.) Physics 3, 4 (Lab., Civ.) Surveying 2 (B.S. in Eng.)	
4	Physical Training 1, 3, 4	Physical Training 1, 3, 4	

NICAL COURSES, 2ND TERM 1915–16, 1ST TERM 1916–17

THURSDAY	FRIDAY	SATURDAY
French 1, 2, 3, 4 German 1, 2, 3, 4 Physics 3, 4 (Quiz)	Chemistry 3 (Min.) French 1, 2, 3, 4 German 1, 2, 3, 4 Mech. Eng. 3, 4 (Civ.) Physics 5, 6	Chemistry 3 (Min.) French 1, 2, 3, 4 German 1, 2, 3, 4 Mech. Eng. 3, 4 (Civ.) Physics 5, 6
English 1, 2 Physics 3, 4 (Lecture) Government 2 (Elective)	Chemistry 3 (Min.) English 1, 2 Government 2 (Elective) Mech. Eng. 3, 4 (Civ.) Physics 5	Chemistry 3 (Min.) English 1, 2 Government 2 (Elective) Mech. Eng. 3, 4 (Civ.) Physics 5
English 3 German 3 (Sect. B) Mathematics 3, 5 (Sect. A), 12	English 3 German 3 (Sect. B) Graphics 4 Mathematics 3, 5 (Sect. A) Mathematics 8 (Sect. B)	English 3 German 3 (Sect. B) Graphics 4 Mathematics 3, 5 (Sect. A) Mathematics 8 (Sect. A)
German 3 (Sect. A) Graphics 3, 4 (Min., Elec., Mech.) Mathematics 3, 5 (Sect. B) Physical Training 3, 4	German 3 (Sect. A) Graphics 3 (Civ.), 4 Mathematics 3, 5 (Sect. B) Mathematics 8 (Sect. B) Physical Training 3, 4	German 3 (Sect. A) Graphics 3, 4 Mathematics 3, 5 (Sect. B) Mathematics 8 (Sect. A)
Civ. Eng. 3 (Sect. A) Graphics 1, 2 (B. S. in Eng.) Mech. Eng. 1, 2 (Mech.) Surveying 2 (B.S. in Chem.)	Civ. Eng. 3 (Sect. A) Graphics 1, 2 (B.S. in Eng.) Mech. Eng. 1, 2 (Mech.) Surveying 2 (B.S. in Chem.)	
Civ. Eng. 3 (Sect. A) Graphics 1, 2 (B.S. in Eng.) Mech. Eng. 1, 2 (Mech.) English 4 (Elective) Surveying 2 (B.S. in Chem.)	Civ. Eng. 3 (Sect. A) Graphics 1, 2 (B.S. in Eng.) Mech. Eng. 1, 2 (Mech.) English 4 (Elective) Surveying 2 (B.S. in Chem.)	
Civ. Eng. 3 (Sect. A) Graphics 1, 2 (B.S. in Eng.) Mech. Eng. 1, 2 (Mech.) Surveying 2 (B.S. in Chem.)	Civ. Eng. 3 (Sect. A) Graphics 1, 2 (B.S. in Eng.) Mech. Eng. 1, 2 (Mech.) Surveying 2 (B.S. in Chem.)	
Physical Training 1, 3, 4	Physical Training 1, 3, 4	

SCHEDULE FOR JUNIOR AND SENIOR CLASSES, TECHNICAL

HR.	MONDAY	TUESDAY	WEDNESDAY
8	Civ.Eng.7,8,10(M.E., E.E., E.M.), 17 Geology 11, 12 Mech. Eng. 7, 8	Civ. Eng. 7, 10 (M.E., E.E., E.M.), 17 Geology 11, 12 Mech. Eng. 7, 8	Civ. Eng. 7, 10 (M.E., E.E., E.M.), 20, 21 Mech. Eng. 7, 8
9	Civ. Eng. 5 (A.B), 12, 16 Economics 3, 4 Elec. Eng. 14, 18 Mech. Eng. 5, 6, 9, 10 Min. Eng. 2	Civ. Eng. 5 (Civ. D), 12 Economics 3, 4 Elec. Eng. 8 Mech. Eng. 5, 6, 9, 10 Min. Eng. 2	Biology 10 Civ. Eng. 15 Economics 4 Elec. Eng. 7, 16 Mech. Eng. 5, 6, 9, 10, 18 Min. Eng. 1, 6
10	Civ. Eng. 15*a*, 16 Elec. Eng. 22 Geology 7, 8 Min. Eng. 2, 3	Civ. Eng. 15, 16 Elec. Eng. 5, 8, 11 Geology 7, 8 Min. Eng. 2, 3	Biology 10 Civ. Eng. 11, 15, 16 Elec. Eng. 5, 7, 14 Mech. Eng. 18 Min. Eng. 1, 10
11	Civ. Eng. 15*a*, 16 Elec. Eng. 5, 11, 22 Geology 7, 8 Min Eng. 2	Civ. Eng. 15, 16 Elec. Eng. 5, 6, 8, 11 Geology 7, 8 Min. Eng. 2	Biology 10 Civ. Eng. 15, 16 Elec. Eng. 5 (Civ. Min.) Elec. Eng. 6, 7, 18 Mech. Eng. 18 Min. Eng. 5
1	Chem. 11, 12 Civ. Eng.13, 18, 29, 30 (Mech. Min.), 31 (Civ. C) Elec. Eng. 3 (Civ. A, B) Geology 13 Mech. Eng. 1, 2, 14, 18 Min. Eng. 12	Chem. 11, 12 Civ. Eng. 13, 18, 29, 30 (Civ. A, B), 31 (Civ. D) Elec. Eng. 3, 10 (Mech.) Geology 13 Mech. Eng. 1, 2 (Elec.), 11, 12 Min. Eng. 12	Public Lectures and student organization meetings
2	Chem. 11, 12 Civ. Eng. 13 (Elec.), 18, 29, 30 (Mech. Min.) 31 (Civ. C) Elec. Eng. 3 (Civ. A, B), 8, 13 Geology 13 Mech. Eng. 1, 2 (Elec.), 18 Min. Eng. 12	Chem. 11, 12 Civ. Eng. 13, 18, 29, 30 (Civ. A, B), 31 (Civ. D) Elec. Eng. 3, 10 (Mech.), 13, 18 Geology 13 Mech. Eng. 1, 2 (Elec.), 11, 12 Min. Eng. 12	Bible 9, 10, 15, 16
3	Chem. 11, 12 Civ. Eng. 13, 18, 29, 30 (Mech. Min.), 31 (Civ. C) Elec. Eng. 3 (Civ. A, B), 8, 13 Geology 13 Mech. Eng. 1, 2 (Elec.), 18 Min. Eng. 12	Chem. 11, 12 Civ. Eng. 13, 18, 29, 30 (Civ. A, B), 31 (Civ. D) Elec. Eng. 3, 10 (Mech.), 13 Geology 13 Mech. Eng. 1, 2 (Elec.), 11, 12 Min. Eng. 12	

COURSES, 2ND TERM 1915–16, 1ST TERM 1916–17

THURSDAY	FRIDAY	SATURDAY
Civ. Eng. 9, 10 (C. E.), 20, 21 Elec. Eng. 6 Law 10	Civ. Eng. 9, 10 (C.E.), 25 Elec. Eng. 6 Law 10	Civ. Eng. 9, 10 (C.E.), 25 Elec. Eng. 6 Law 10
Biology 10 Chem. 21 Civ. Eng. 15, 16 Elec. Eng. 5, 7, 12, 16 Mech. Eng. 16 Min. Eng. 6	Civ. Eng. 6, 15, 16 Elec. Eng. 3, 4, 16 Min. Eng. 8 Mech. Eng. 14	Civ. Eng. 6, 15, 16 Elec. Eng. 12, 24 Min. Eng. 8
Biology 9, 10 Chem. 21 Civ. Eng. 11, 15, 16 Elec. Eng. 7, 11, 12, 16 (Mech.) Min. Eng. 1, 10 Mech. Eng. 16	Biology 9 Civ. Eng. 5, 6, 15, 16 Elec. Eng. 3, 4, 16 (Mech.)	Biology 9 Civ. Eng. 5, 6, 15*a*, 16 Elec. Eng. 21 Geology 9
Biology 9, 10 Chem. 21 Civ. Eng. 15, 16 Elec. Eng. 5 (Civ. Min.) Elec. Eng. 6, 7, 18 Mech. Eng. 16 Min. Eng. 4	Biology 9 Civ. Eng. 5, 15, 16 Elec. Eng. 3, 4, 11 Min. Eng. 4, 5	Biology 9 Civ. Eng. 5, 6, 15*a*, 16 Elec. Eng. 21, 24 Geology 9 Min. Eng. 4
Chem. 21 Civ. Eng. 29, 30 (Civ. C, D), 31 (Civ. A), 26 Elec. Eng. 3, 4 (Elect.) Geology 14 Mech. Eng. 1, 2 (Mech.), 11, 12	Civ. Eng. 29, 30 (Elec.), 8, 31 (Civ. B), 36 Elec. Eng. 3, 4 (Civ. C, D), 24 Geology 9, 14 Mech. Eng. 1, 2 (Mech.), 11, 12 Min. Eng. 1	
Chem. 21 Civ. Eng. 29, 30 (Civ. C, D), 31 (Civ. A), 26 Elec. Eng. 3, 4 (Elec.), 11 Geology 14 Mech. Eng. 1, 2 (Mech.), 11, 12	Civ. Eng. 29, 30 (Elec.), 14, 31 (Civ. B), 36 Elec. Eng. 3, 4 (Civ. C, D), 24 Geology 9, 14 Mech. Eng. 1, 2 (Mech.), 11, 12 Min. Eng. 1	
Chem. 21 Civ. Eng. 29, 30 (Civ. C, D), 31 (Civ. A), 26 Elec. Eng. 3, 4 (Elect.) Geology 14 Mech. Eng. 1, 2 (Mech.), 11, 12	Civ. Eng. 29, 30 (Elect.) Civ. Eng. 31 (Civ. B), 36 Elec. Eng. 3, 4 (Civ. C, D), 24 Geology 9, 14 Mech. Eng. 1, 2 (Mech.), 11, 12 Min. Eng. 1	

COURSES OF INSTRUCTION

BIBLE

1–2. THE BIBLE.—General survey of the Old Testament and the Life of Christ. Required of all students throughout the Freshman year. One hour.

3–4. THE NEW TESTAMENT.—The Gospels. Required of Technical students throughout the Sophomore year. One hour.

5–6. THE NEW TESTAMENT.—The Gospels, in Greek. Required of Classical students throughout the Sophomore year. One hour.

7–8. THE NEW TESTAMENT.—The Gospels, in Latin. Required of Latin Scientific students throughout the Sophomore year. One hour.

9–10. THE NEW TESTAMENT.—The Acts of the Apostles. Required of Technical and General Scientific students throughout the Junior year. One hour.

11–12. THE NEW TESTAMENT.—The Acts of the Apostles, in Greek. Required of Classical students throughout the Junior year. One hour.

13–14. THE PLAN OF REDEMPTION.—Required of Latin Scientific students throughout the Junior year. One hour.

15. HISTORY OF THE ENGLISH BIBLE.—Required of all Seniors. First term, Senior year. One hour.

16. CHURCH HISTORY.—Practical Ethics. Required of all Technical Seniors. Second term. One hour.

18. PRACTICAL ETHICS.—Second term. One hour.

GROUP I.—LANGUAGE AND LITERATURE

ENGLISH

Professors March and Tupper and Messrs. Bierstadt, Hutchins, and Knowlton

1–2. COMPOSITION.—Themes. Conferences. Required of all Freshmen. First and Second terms. 3 hours. Professor TUPPER and Messrs. BIERSTADT, HUTCHINS, and KNOWLTON.

3. ENGLISH LITERATURE OF THE XVIII AND XIX CENTURIES.—Required of Sophomores in the Engineering and Chemistry divisions. First term. 3 hours. Professor TUPPER and Messrs. BIERSTADT, HUTCHINS, and KNOWLTON.

4. ENGLISH LITERATURE.—Selected Elizabethan Plays. Open only to Sophomores in the Engineering and Chemistry divisions. Second term. 3 hours. Professor TUPPER and Messrs. BIERSTADT, HUTCHINS, and KNOWLTON.

5–6. AN INTRODUCTION TO THE STUDY OF THE ENGLISH LANGUAGE.—Open to Sophomores in Arts and Science. First and Second terms. The Class of '83 prize. Professor MARCH.

7–8. THE CRITICAL STUDY OF THE TEXT OF SHAKESPEARE.—Open to Juniors. First and Second terms. 3 hours. The Shakespeare prize. Professor MARCH.

9. THE PROSE WORKS OF EDGAR ALLAN POE.—Open to Juniors and Seniors. First term. 3 hours. The Francis A. March prize. Professor MARCH.

10. ENGLISH PROSE FICTION.—NOVELS—Open to Juniors and Seniors. Second term. 3 hours. Professor MARCH.

11–12. THE SHORT STORY.—Open to Seniors. First and Second terms. 3 hours. Professor MARCH.

15–16. ENGLISH LITERATURE (EXCLUSIVE OF THE DRAMA), FROM THE BIRTH OF MILTON (1608) TO THE DEATH OF BURNS (1796).—Open to Juniors and Seniors. First and Second terms. 3 hours. Professor TUPPER. Omitted 1916–1917.

17–18. THE POETRY OF THE NINETEENTH CENTURY.—Open to Juniors and Seniors. First and Second terms. 3 hours. Professor TUPPER. Omitted 1916–1917.

20. THE MODERN DRAMA.—Open only to those Juniors and Seniors who have elected courses in English literature. Second term. 3 hours. Professor TUPPER. Omitted 1916–1917.

21–22. ENGLISH DRAMA FROM THE BEGINNINGS TO SHERIDAN.—Open to Juniors and Seniors. First and Second terms. 3 hours. Professor TUPPER. Omitted in 1915–1916.

23–24. ENGLISH PROSE OF THE NINETEENTH CENTURY.—Open to Juniors and Seniors. First and Second terms. 3 hours. Professor TUPPER. Omitted in 1915–1916.

25. Anglo-Saxon Grammar and Reading.—Open to Juniors and Seniors. First term. 3 hours. The Early English Text Society's prize. Professor March. Omitted in 1915–1916.
26. Chaucer.—Open to Juniors and Seniors. Second term. 3 hours. The Lounsbury prize. Professor March. Omitted in 1915–1916.

Candidates for honors in English must complete at least four 3-hour year courses, which will include Anglo-Saxon Grammar and Reading, Chaucer, and a year course in literature. They must also do such special reading in connection with the courses as the professor in charge may assign, and they must select some author for special study. They must stand an examination at the end of the senior year covering all the work in their honors courses and write a thesis on some subject approved by the department.

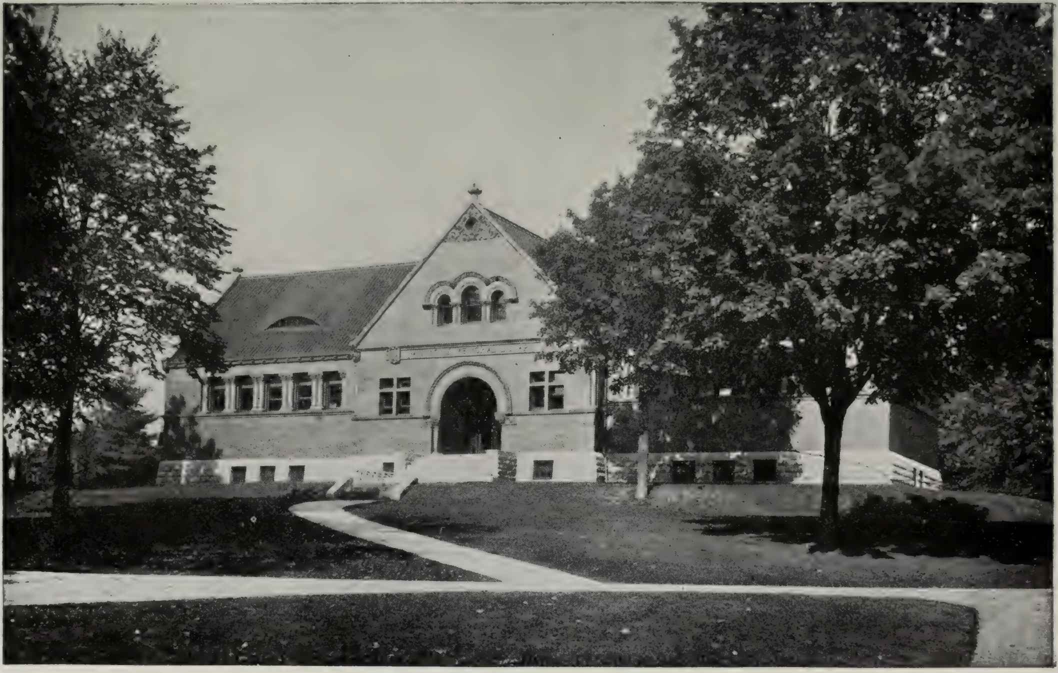
THE GREEK LANGUAGE AND LITERATURE

Professor Rankin and Mr. Cram

For the degree of A.B., one year of Greek is required of students who offer three units of Greek at entrance. A prescribed course (Greek 5 and 6) must be taken in Sophomore year, however, by those who desire to make Greek their major subject in Junior and Senior years.

Students who do not offer Greek at entrance are required to take two years of Greek for the degree of A.B. They, too, may elect Greek as their major subject by taking the prescribed course in their Junior year, in addition to the courses ordinarily required in the case of major subjects.

All Junior and Senior courses are open to Candidates for Honors in the Department of Greek. All such candidates are required to do the supplementary reading announced in connection with the courses described below. Especial attention is called to the fact that properly qualified students may be allowed to take certain courses offered by the Department, even if they possess no knowledge of Greek. Such students will do the required collateral reading in translations of the authors assigned.



VAN WICKLE MEMORIAL LIBRARY.

1. COURSE FOR BEGINNERS.—Benner and Smyth, *Beginner's Greek Book*. Freshman course, required for the degree of A.B. First term. 3 hours. Professor RANKIN and Mr. CRAM.
2. COURSE FOR BEGINNERS. Xenophon, *Anabasis* (Murray), selections. Greek Prose Composition (Pearson). Freshman course, required for the degree of A.B. Second term. 3 hours. Professor RANKIN and Mr. CRAM.
3. GREEK LITERATURE.—Homer, *The Odyssey* (Merry), selections from books I–XII. Herodotus, books VII and VIII (Smith and Laird). Greek Prose Composition (Pearson). Sophomore course, required for the degree of A.B. First term. 3 hours. Students who offer Greek at entrance will take this course in their Freshman year. Professor RANKIN and Mr. CRAM.
4. GREEK LITERATURE.—Plato, *The Apology* (Dyer and Seymour). The Early Attic Orators (Jebb). Euripides, *Iphigenia among the Taurians* (Bates). Primer of Greek Literature (Jebb). Sophomore course, required for the degree of A.B. Second term. 3 hours. Students who offer Greek at entrance will take this course in their Freshman year. Professor RANKIN and Mr. CRAM.
5. THE GREEK DRAMA.—Aeschylus, *Prometheus Bound* (Wecklein-Allen). Sophocles, *Oedipus the King* (Jebb). Aristophanes, *The Frogs* (Merry). Themes on the Greek Drama and on scenic antiquities. Elective course. First term. 3 hours. Prescribed course for students who make Greek their major subject. Mr. CRAM.
6. GREEK HISTORY AND ORATORY.—Thucydides, books VI and VII (Marchant). Demosthenes, *On the Crown* (Humphreys). Themes on subjects connected with the Peloponnesian War and the rise of Macedon. Elective course. Second term. 3 hours. Prescribed course for students who make Greek their major subject. Mr. CRAM.
7. THE HISTORY OF GREECE.—Bury, *A History of Greece to the Death of Alexander the Great* (edition of 1913). Lectures and

recitations, with the use of the stereopticon. Collateral reading in translations of the Greek Historians and in the larger works of Bury, Grote, Curtius, Holm and others. Junior course, prescribed for students who make Greek their major subject. First term. 3 hours. The course may be taken by properly qualified Juniors, whether they have taken Greek or not. Mr. CRAM.

Candidates for Honors will do collateral reading in the original texts of the Greek Historians, in addition to the reading required of all students in this course.

8. THE HISTORY OF GREEK LITERATURE.—Wright, *A Short History of Greek Literature.* Collateral reading, in the authors less commonly read, in Wright and Abbott's *Golden Treasury of Ancient Greek Poetry* and in Wright and Shadwell's *Golden Treasury of Greek Prose.* Junior course, prescribed for students who make Greek their major subject. Second term. 3 hours. The course may be taken by properly qualified Juniors, whether they have taken Greek or not. Professor RANKIN.

Candidates for Honors will do additional collateral reading and prepare a special report upon some selected author.

9. THE GREEK EPIC.—Homer, *The Iliad* (Monro). The entire *Iliad* will be read, in the original text and in translations, and a certain number of lectures will be given on Homeric antiquities and on Homer's influence upon ancient and modern literature. Junior course. First term. 3 hours. Omitted in 1915–1916. Professor RANKIN.

Candidates for Honors will read the entire *Iliad* in the original Greek and prepare a written report on some assigned subject.

10. THE GREEK COMEDY.—Aristophanes, *Acharnians* (Merry) and *Cloudo* (Forman). Menander, fragmentary plays (Capps). Lectures and collateral reading on the origin and development of Greek Comedy. Junior course. Second term. 3 hours. Mr. CRAM.

Candidates for Honors will also read the *Birds* and *Knights* of Aristophanes.

11. GREEK PHILOSOPHY.—Plato, *Republic* (Adam), books II, VI and VIII, with large parts of the other books. Lectures, with a limited amount of collateral reading, on the pre-Socratic philosophers and the philosophy of the Socratic school. Senior course. First term. 3 hours. Professor RANKIN.

Candidates for Honors will read the *Republic*, entire, and do additional collateral reading.

12. GREEK PHILOSOPHY.—Aristotle, *Nicomachean Ethics* (Bywater), books I, II, III and X, with parts of books IV and V. Lectures, with collateral reading, on the Aristotelian school, with particular reference to Aristotle's place in the history of ethical thought. Senior course. Second term. 3 hours. Professor RANKIN.

Candidates for Honors will read books I–VII, and X, and will do additional collateral reading.

13. THE GREEK LYRIC POETS.—Tyler, *Selections from the Greek Lyric Poets.* Seymour, *Selected Odes of Pindar.* Lectures, and collateral reading, on the historical development of Greek lyric poetry. Senior course. First term. 3 hours. Omitted in 1915–1916. Professor RANKIN.

Candidates for Honors will read about six hundred verses of Pindar and Bacchylides in addition to the work assigned for the other members of the class.

14. THE GREEK PASTORAL, WITH SOME STUDY OF THE MIME.—Theocritus, Bion, Moschus, and Herondas. Wilamowitz-Mœllendorf, *Bucolici Graeci.* Crusius, *Herondae Mimiambi.* Lectures and collateral reading, with particular reference to the influence of the Greek Pastoral on modern literature. Senior course. Second term. 3 hours. Omitted in 1915–1916. Professor RANKIN.

Candidates for Honors will read all the Idyls of Theocritus.

15. THE LIFE AND THOUGHT OF THE GREEKS, AS ILLUSTRATED IN THE MONUMENTS AND IN THE LITERATURE.—Gulick, *The Life of the Ancient Greeks.* Lectures and collateral reading in representative authors and in books of reference; illustrated by means of the stereopticon, photographs and other illustrative

material. Properly qualified Seniors who do not know Greek may take this course. Senior course. First term. 3 hours. Professor RANKIN.

Candidates for Honors will present a special report, on some assigned subject, which shall be based upon an investigation of original sources.

16. THE RELIGION AND WORSHIP OF THE GREEKS.—Fairbanks, *A Handbook of Greek Religion.* Lectures, collateral reading and reports on special topics of investigation. The course will deal with the development of religious beliefs and forms of ritual and worship among the Greeks from the earliest times to the conflict between Paganism and Christianity. Properly qualified Seniors who do not know Greek may take this course. Senior course. Second term. Omitted in 1915–1916. Professor RANKIN.

Candidates for Honors will prepare a special report based upon investigation of original sources.

17. LUCIAN AND HIS TIMES.—Allinson, *Lucian: Selected Writings.* Lectures and collateral reading, with reports on special topics of investigation relating to the life, morals and beliefs of the second century A.D. and to Lucian's use of a new literary type and his influence on later literature. Junior course. First term. 3 hours. Mr. CRAM.

Candidates for Honors will be assigned additional reading in Lucian's works and will present a report based on original investigation.

18. THE GREEK NEW TESTAMENT.—Westcott and Hort, *The New Testament in Greek.* Selected Epistles of St. Paul will be read, with particular reference to the life and times of the author, the content and significance of his writings, his style and diction. Junior course. Second term. 3 hours. Omitted in 1915–1916. Professor RANKIN.

Candidates for Honors will read two Epistles of St. Paul in addition to those read by the other members of the class and prepare a special report on one of these Epistles.

20. GREEK PROSE COMPOSITION.—Translation from standard

English authors and original essays based on classical models. Senior course, prescribed for students who elect Greek as their major subject. First and second terms. 1 hour. Omitted in 1915–1916. Professor RANKIN.

LATIN

Professor Owen, Assistant Professor Lacey, Mr. Aston

1. LIVY, HORACE, ODES.—The Punic Wars. Latin Prose. First term, Freshman. 3 hours. Professors OWEN and LACEY, Mr. ASTON.
2. HORACE, EPODES, SATIRES, AND LETTERS.—Roman Life. Latin Prose. Second term, Freshman. 3 hours. Professors OWEN and LACEY, Mr. ASTON.
3. CICERO, DE ORATORE.—Latin Hymns. Roman History, from the Gracchi to Augustus. First term. Sophomore. 3 hours. Professors OWEN and LACEY.
4. CICERO, DE OFFICIIS.—Latin Hymns. Early Roman History. Second term, Sophomore. 3 hours. Professors OWEN and LACEY.
5. TACITUS, AGRICOLA AND GERMANIA.—Epistolary Latin. Pliny's Letters. Open to Juniors and Seniors. First term. 3 hours. Professor OWEN. Given in 1915–1916.
7. JUVENAL, SATIRES.—Terence, *Phormio*. Roman Archaeology. Open to Juniors and Seniors. First term. 3 hours. Given in 1916–1917. Professor OWEN.

MODERN LANGUAGES

Professor Fehr, Assistant Professor Hopkins, Assistant Professor Jones, Mr. Luker

In the A.B. course, German 1 or French 1 will be scheduled, provided these have not been used for entrance. If two units of either of these languages are offered for entrance, then French 3 or German 3 must be scheduled.

In the Ph.B. course the following alternates are offered. (1) Three years of one modern language and one year of the other, including preparatory work, must be completed; or (2) two years of each modern language, including preparatory work, must be completed.

In the B.S. course, two years in both French and German, including preparatory work, must be completed.

In the engineering courses either French or German is scheduled for the Freshman year, as the entering student may elect. If two units of German are offered for entrance, French 1 or German 3 is scheduled. If two units of French are offered for entrance, German 1 or French 3 is scheduled. In the second term of the Sophomore year an opportunity is offered to continue advanced work in either French or German.

In the pre-medical and Chemistry courses German is required in the Freshman year.

FRENCH

French 1. ELEMENTARY FRENCH.—Grammar, prose composition, aural drill, conversation, reading of easy prose. First term. 3 hours.

French 2. INTERMEDIATE FRENCH.—Translation and sight-reading from standard authors. Prose composition. Second term. 3 hours.

French 3. ADVANCED FRENCH.—Prescribed for those offering French for entrance. Review of grammar. Translation from various modern authors. Prose composition. First term. 3 hours.

French 4. ADVANCED FRENCH.—Continuation of French 3. Scientific French. Modern plays. Prose composition. Second term. 3 hours.

French 21. FRENCH HISTORY.—Open to Sophomores who have completed French 1 and 2 in college and to Juniors who have completed French 3 and 4. Translation from various French historians. Collateral readings and reports. First term. 3 hours.

French 22. MODERN FRENCH NOVEL.—Selections are read from Dumas *père*, Hugo, Sand, Zola, etc. Assigned outside readings and reports. Second term. 3 hours.

French 23. FRENCH TRAGEDY.—A study of the tragedy from Corneille to Rostand. Assigned outside readings and reports. Lectures. First term. 3 hours.

French 24. FRENCH COMEDY.—The comedy from Molière to Dumas *fils*. Assigned readings. Lectures. Second term. 3 hours.

French 25. FRENCH LITERATURE OF THE SIXTEENTH CENTURY.—Selections from Ronsard, Marguerite de Valois, Jodelle, Marot, etc. The Pléiade. Alternates with French 23. First term. 3 hours.

French 26. HISTORICAL FRENCH GRAMMAR.—Development of French from Latin. Alternates with French 24. Second term. 3 hours.

GERMAN

German 1. ELEMENTARY GERMAN.—Grammar and reading. Written and oral work. First term. 3 hours.

German 2. ELEMENTARY GERMAN.—Continued. Second term. 3 hours.

German 3. INTERMEDIATE GERMAN.—German syntax, prose composition, and the reading of more difficult prose. Preparation required: German 1 and 2, or a minimum of 2 units offered for entrance. First term. 3 hours.

German 4. ADVANCED GERMAN.—Rapid reading of historical novels relating to the history and development of the Teutonic race. Preparation required: German 3, or a minimum of 3 units offered for entrance. Second term. 3 hours.

German 11. NINETEENTH CENTURY WRITERS.—First term. 3 hours.

German 12. NINETEENTH CENTURY WRITERS.—Second term. 3 hours.

German 13. SCHILLER AND HIS WORKS.—First term. 3 hours. Offered 1916–17.

German 14. GOETHE AND HIS WORKS.—Second term. 3 hours. Not given 1915–16.

German 21. GOETHE'S FAUST.—To be offered in 1917–18. First term. 3 hours.

German 22. GOETHE'S FAUST.—Continued. Second term. 3 hours.

German 23. GRILLPARZER AND HIS WORKS.—To be offered in 1916–17 and 1918–19. First term. 3 hours.

German 24. GRILLPARZER AND HIS WORKS.—Continued. Second term. 3 hours.

German 27. HISTORY OF GERMAN LITERATURE.—First term. 3 hours.

German 28. TEACHER'S COURSE.—A critical study of the methods of teaching modern languages. Phonetics. Selection and criticism of text-books. Second term. 3 hours.

German 31. MIDDLE HIGH GERMAN.—First term. 3 hours.

German 32. MIDDLE HIGH GERMAN.—Continued. Second term. 3 hours.

ITALIAN

Italian 1. ELEMENTARY ITALIAN.—Grammar, simple prose composition, reading of easy prose. First term. 3 hours.

Italian 2. INTERMEDIATE ITALIAN.—Reading of modern Italian prose such as Manzoni's *I Promessi Sposi.* Second term. 3 hours.

Italian 3. DANTE.—Reading of selected *canti* of the *Divina Commedia.* A study of Dante and his place in Florentine history. First term. 3 hours.

Italian 4. (*a*) BOCCACCIO.—Selected *novelle* from the *Decamerone* are read. Discussions as to the origin of some of the tales. (*b*) *Petrarch.*—A study of the Sonnet, Madrigal, Canzone, etc. Second term. 3 hours.

SPANISH

Spanish 1. ELEMENTARY SPANISH.—Grammar, prose composition, aural drill, conversation, translation of easy prose. First term. 3 hours.

Spanish 2. INTERMEDIATE SPANISH.—Continued practice in composition and conversation. Translation and sight-reading of representative authors such as Alarcón, Galdós, Valera, Valdés. Second term. 3 hours.

Spanish 3. ADVANCED SPANISH.—Drama. Translation of plays of Echegaray, Gil y Zarate, Moratín, etc. Continued prose composition. First term. 3 hours.

Spanish 4. COMMERCIAL SPANISH.—Practice in Spanish correspondence and use of business terms. Second term. 3 hours.

GROUP II.—EDUCATION, HISTORY, PHILOSOPHY AND POLITICAL SCIENCE

ECONOMICS

Professor Stewart

2. PRINCIPLES OF ECONOMICS.—Second term. 3 hours.
3. BUSINESS CORPORATIONS, TRUSTS, AND THE LABOR PROBLEM.—First term. 2 hours. Not given, 1916–1917.
4. MONEY AND BANKING.—Second term. 3 hours.
5. TRANSPORTATION AND TRADE, FOREIGN AND DOMESTIC.—First term. 2 hours. Given alternately with No. 3.

GOVERNMENT AND LAW

Mr. Kirkpatrick

Mr. Chidsey

2. AMERICAN GOVERNMENT AND POLITICS, FEDERAL, STATE AND MUNICIPAL.—Second term. 3 hours.
3. GOVERNMENTS AND PARTIES OF MODERN EUROPE.—Introduction to Political Science and Comparative Government. First term. 3 hours.
5. INTERNATIONAL LAW.—First term. 3 hours. Not given 1916–1917. MR. CHIDSEY.
9. LAW.—Blackstone's Commentaries. First term. 3 hours. Mr. KIRKPATRICK.
10. BUSINESS LAW.—Contracts, agency, partnership corporations, sales, insurance, estates and negotiable paper. Second term. 2 hours. Mr. KIRKPATRICK.
7. MUNICIPAL GOVERNMENT.—First term. 3 hours. Given alternately with No. 5.

HISTORY

Assistant Professor Heckel

2. MODERN EUROPEAN HISTORY.—Introductory Course. Second term. 3 hours. Professor HECKEL.
3. HISTORY OF ENGLAND.—Tudor and Stuart dynasties. First term. 3 hours. Professor HECKEL.

4. AMERICAN POLITICAL AND CONSTITUTIONAL HISTORY.—From the Revolution to the Civil War. Second term. 3 hours.
5. AMERICAN HISTORY.—From the Civil War to the present. First term. 3 hours. Professor HECKEL.
7. MEDIAEVAL EUROPE.—From the barbarian migrations to the Renaissance. Open to Juniors and Seniors. First term. 3 hours. Not given 1916–1917.
8. RENAISSANCE AND REFORMATION.—Open to Juniors and Seniors. Second term. 3 hours. Not given 1916–1917.
9. CHURCH HISTORY.—History of the Christian Church to the fifteenth century. First term. 3 hours. Given alternately with No. 7. Professor HECKEL.
10. SEMINAR IN ENGLISH HISTORY.—Second term. 3 hours. Given alternately with No. 8. Professor HECKEL.
11. HISTORY OF ENGLAND.—Political and Constitutional History of the Eighteenth and Nineteenth centuries. First term. 3 hours. Given alternately with No. 3.

History of Greece.—See announcement in Department of Greek, No. 7. First term. 3 hours.

PHILOSOPHY

Professor Martin

The courses offered in this department are Psychology, Logic, Ethics, Theism, History of Philosophy and Metaphysics. These are open to Juniors and Seniors, but should be taken in the order in which they are mentioned below.

1. PSYCHOLOGY.—Chiefly text-book work with assigned reading and supplementary lectures. Text-book, James' *Briefer Course*. First term. Three hours.
2. LOGIC.—Text-book and exercises. Second term. Three hours.
3. ETHICS.—Lectures, assigned readings and themes. Elementary course in psychology is required for entrance to this course. First term. Three hours.
4. THEISM.—Text-book, Flint's *Theism*, and lectures. Second term. One hour.
5. HISTORY OF ANCIENT PHILOSOPHY.—First term. Three hours.

6. History of Modern Philosophy.—Second term. Two hours.
8. Metaphysics.—Alternating with History of Modern Philosophy and Theism. Second term. Three hours.

Pedagogy.—In connection with the courses in Philosophy, provision is made for such courses in Pedagogy as are required by the State of Pennsylvania of applicants for certificate to teach in the public schools of that state. More advanced study in Pedagogy is provided from time to time as may be demanded.

9. History of Education.—Text-book, Monroe. Lectures and themes. First term. Three hours.
10. Educational Psychology.—Text-book. Lectures and experiments. Second term. Three hours.

Lectures on Education.—The regular instruction in this department is supplemented by lectures bearing more directly on the practical side of the teacher's work.

SOCIOLOGY

Mr. Aston

1. Principles of Sociology.—First term. 3 hours.
2. Social Reform, and Applied Sociology.—Second term. 3 hours.

Group III.—Mathematics and Science

PARDEE SCIENTIFIC DEPARTMENT

BIOLOGY

Professor Kunkel, Assistant Professor Foster

All courses involve 5 hours of laboratory work a week and 1 hour recitation or quiz.

1. General Biology.—Preliminary to all other courses in Biology offered except Sanitary Biology. Open to all classes as an elective. Required of Pre-medical students in Freshman year. First term. 3 hours. Professor Kunkel.
2. Bacteriology.—Open to Juniors and Seniors who have had Biology 1. Required of Pre-medical students in Sophomore year. Second term. 3 hours. Assistant Professor Foster.

3. Botany.—Open to all students who have had Biology 1. Required of Pre-medical students in Sophomore year. First term. 3 hours. Assistant Professor Foster.
4. Vertebrate Zoölogy.—Open to all students who have had Biology 1. Required of Pre-medical students in Freshman year. Second term. 3 hours. Professor Kunkel.
5. Physiology.—Open to Juniors and Seniors who have had Biology 1. Required of Pre-medical students in Sophomore year in 1917–18 and in alternate years. First term. 3 hours. Professor Kunkel.
7. Invertebrate Zoölogy.—Open to Juniors and Seniors who have had Biology 1. Required of Pre-medical students in Sophomore year in 1916–17 and in alternate years. First term. 3 hours. Professor Kunkel.
6. Embryology.—Open to Juniors and Seniors who have had Biology 1 and either 4 or 7. Required of Pre-medical students in Sophomore year. Second term. 3 hours. Professor Kunkel.
9. Sanitary Biology.—Required of mechanical and mining engineers and chemists. First term. 3 hours. Assistant Professor Foster.
10. Sanitary Biology.—Required of civil engineers and students in the general scientific course. (A repetition of 9.) Second term. 3 hours. Assistant Professor Foster.

CHEMISTRY

There are two professional courses in Chemistry, leading to the degrees of Bachelor of Science in Chemical Engineering and Bachelor of Science in Chemistry, respectively. The first of these courses is intended to fit the candidate to build, equip and operate chemical plants or plants wherein chemical knowledge plays an important part such as soap factories, dye works, tanneries, cement plants, steel mills, etc. The second course gives a wider chemical training and is better fitted for those preparing as analytical chemists or teachers or those requiring a broad knowledge to fit them for other professions, such as medicine.

Those who take the Chemical Courses receive the same instruc-

GAYLEY LABORATORY OF CHEMISTRY AND METALLURGY.

tion in mathematics, drawing, shop-work, modern languages, physics and elementary chemistry up to and including elementary quantitative analysis during Freshman and Sophomore years as the other engineering students.

THE CHEMICAL ENGINEERING COURSE

This course has been arranged in response to recent demands for graduates in chemistry with some knowledge of engineering. In addition to the necessary chemical training instruction is given in appropriate engineering studies. The student is in this way fitted for construction work and management. With this in view a course is also given in industrial management. (See page 36.)

THE CHEMICAL COURSE

This course is intended to fit young men for practical work in chemistry either as chemists in iron and steel works, in manufacturing establishments as chemical manufacturers, as teachers or as preparatory to a course in medicine. Special attention is paid to analytical chemistry, the cement industry, metallurgy and assaying.

New methods of teaching qualitative analysis and organic chemistry have been used with great success recently with the result of increased interest and more rapid progress.

Graduates are fitted to take paid positions immediately upon graduation. For men of good character, well-paid positions can be obtained without difficulty.

EQUIPMENT

The Chemical and Metallurgical laboratories are contained in Gayley Hall, a fire-proof structure built for the use of this Department. There are four large and four smaller laboratories and a shop, besides three stock rooms, two balance rooms, two quiz rooms, a lecture room, a room containing the museum and the books of the Henry W. Oliver Chemical and Metallurgical Library, and three rooms for instructors.

The two balance rooms adjoin the quantitative laboratory, and one of them may be entered from the qualitative laboratory.

Two large laboratories each have desk room for 48 students. The qualitative laboratory has desk room for 88 students and the beginners' laboratory for 232. Water and gas are supplied to each student, and each room is supplied with air blast and electric current. They are well lighted, and heated by steam. The smaller laboratories are arranged for assaying, industrial work, gas analysis, microscopic and photographic work, and various other determinations made with the polariscope, spectroscope, calorimeter, etc. For this and other work properly belonging to the department, there is an adequate equipment.

2. QUANTITATIVE AND QUALITATIVE ANALYSIS.—Freshman year. Second term. 3 hours.

3. QUALITATIVE ANALYSIS.—For Chemists, Chemical Engineers and Mechanical Engineers. Sophomore year. First term. 2 hours.

3*b*. QUALITATIVE ANALYSIS.—For B.S. (elective). Sophomore year. First term. 3 hours.

3*c*. QUALITATIVE ANALYSIS.—For Pre-medicals. Sophomore year. First term. 5 hours.

4. ORGANIC CHEMISTRY.—Sophomore year. For Chemists. Second term. 2 hours.

4*b*. ORGANIC CHEMISTRY.—For B.S. Sophomore year. Second term. 3 hours.

4*c*. ORGANIC CHEMISTRY.—For Pre-medicals. Sophomore year. Second term. 5 hours.

4*d*. ORGANIC CHEMISTRY.—For Chemical Engineers. Junior year. Second term. 2 hours.

5. QUANTITATIVE ANALYSIS.—For Chemists. Junior year. First term. 3 hours.

5*b*. QUANTITATIVE ANALYSIS.—For Chemical Engineers. Junior year. First term. 2 hours.

6. QUANTITATIVE ANALYSIS.—Junior year. Second term. 6 hours.

7. THEORETICAL CHEMISTRY.—Junior year. First term. 2 hours.
8. THEORETICAL CHEMISTRY.—Junior year. Second term. 2 hours.
9. CHEMICAL ARITHMETIC.—Junior year. First term. 2 hours.
11. METALLURGY.—Junior year. First term. 2 hours.
12. METALLURGY. Junior year. Second term. 2 hours.
12*a* METALLURGY. For Mechanical Engineering. Junior year. Second term. 2 hours.
13. CHEMICAL GERMAN.—Junior year. First term. 1 hour.
14. CHEMICAL GERMAN.—Junior year. Second term. 1 hour.
15. ORGANIC CHEMISTRY.—For Chemists. Junior year. First term. 4 hours.
15*b*. ORGANIC CHEMISTRY.—For Chemical Engineers. Senior year. First term. 2 hours.
16. ORGANIC AND INORGANIC PREPARATIONS.—Junior year. Second term. 4 hours.
17. CHEMICAL ENGINEERING.—Senior year. First term. 3 hours.
18. CHEMICAL TECHNOLOGY.—Senior year. Second term. 3 hours.
19. CHEMICAL GERMAN. Senior year. First term. 1 hour.
20. CHEMICAL GERMAN.—Senior year. Second term. 1 hour.
21. ASSAYING.—Senior year. First term. 2 hours.
23. QUANTITATIVE ANALYSIS.—For Chemists. Senior year. First term. 4 hours.
23*b*. QUANTITATIVE ANALYSIS.—For Chemical Engineers. Senior year. First term. 2 hours.
24. THESIS WORK.—For Chemists. Senior year. Second term. 6 hours.
24*b*. THESIS WORK.—For Chemical Engineers. Senior year. Second term. 3 hours.
25. ORGANIC AND INORGANIC PREPARATIONS.—Senior year. First term. 2 hours.
27. QUALITATIVE ANALYSIS.—Junior or Senior year, for A.B. and Ph.B. students who elected Chemistry in Freshman year, First term. 2 hours.
28. QUALITATIVE ANALYSIS.—Continuation of 27. Second term. 2 hours.

29. ORGANIC CHEMISTRY OR QUANTITATIVE ANALYSIS.—Senior year. For those who have had 27 and 28. First term. 2 hours.

30. ORGANIC CHEMISTRY OR QUANTITATIVE ANALYSIS.—Continuation of 29. Second term. 2 hours.

31. DESCRIPTIVE CHEMISTRY.—For A.B. and Ph.B. students beginning Chemistry. Junior year. First term. 3 hours.

32. QUALITATIVE ANALYSIS.—For A.B. and Ph.B. students who elected 31. Junior year. Second term. 3 hours.

33. QUALITATIVE ANALYSIS.—Senior year. Continuation of 32. First term. 2 hours.

34. ORGANIC OR QUANTITATIVE ANALYSIS.—Senior year, for those who have had 31 and 32. Second term. 2 hours.

35–36. CHEMICAL GERMAN.—For Chemical Engineers. Sophomore year. First and second terms. 1 hour.

37. AGRICULTURAL CHEMISTRY.—Senior year. First term. 1 hour.

38. HYDRO- AND ELECTROMETALLURGY.—Senior year. Second term. 2 hours.

40. GLASS BLOWING.—Sophomore year. Second term. 1 hour.

42. THE RARER ELEMENTS.—Sophomore year. Second term. 1 hour.

44. CHEMISTRY OF THE SILICATES (CERAMICS).—Sophomore year. Second term. 1 hour.

GEOLOGY

Professor Peck, and Mr. Fretz

1. DYNAMICAL, STRUCTURAL AND PHYSIOGRAPHICAL GEOLOGY. Elective for Juniors and Seniors. First term. 3 hours.
2. HISTORICAL GEOLOGY.—Elective for Juniors and Seniors. Second term. 3 hours.
3. FIELD GEOLOGY.—Followed by Paleontology. Elective for Juniors and Seniors. First term. 3 hours.
4. TERTIARY MAMMALS.—Man and the Glacial Period. Elective for Juniors and Seniors. Second term. 3 hours.
5. CRYSTALLOGRAPHY.—Elective for Juniors and Seniors proposing to Major in Geology. First term. 3 hours.

6. Petrography.—Elective for Juniors and Seniors proposing to Major in Geology. Second term. 3 hours.
7. General Geology.—Short Course. Required for Junior Civils, Chemists and Miners. First term. 2 hours.
8. General Geology.—Continued. Short Course. Required for Junior Civils, Chemists and Miners. Second term. 2 hours.
9. Field and Economic Geology.—Required for Senior Civils (1916 only), Chemists and Miners. First term. 2 hours.
11. Geology of Ore Deposits.—Required for Senior Chemists and Miners. First term. 2 hours.
12. Geology of Ore Deposits.—Continued. Required for Senior Chemists and Miners. Second term. 2 hours.
13. Systematic Mineralogy.—Required for the Senior Chemists and Miners. First term. 2 hours.
14. Petrography and Goniometrical Measurements.—Required for Senior Chemists and Miners. Second term. 2 hours.

GRAPHICS

Professor Graves and Mr. Moore

1. Drawing, Lettering, and Projection.—First term, Freshman year. Text-books—"Mechanical Drawing," Graves, and "Free-hand Lettering," Reinhardt. 2 hours.

a. Drawing.—Lectures on instruments and materials; elementary plates to afford practice in using the drawing instruments and illustrate the simpler operations of drawing; recitations and drawing plates on conic sections.

b. Lettering.—Analytical study of, and practice in making, lower case and capital letters suitable for general engineering drawing; the lettering of connected sentences to acquire facility in spacing; lettering for titles.

c. Orthographic Projection.—Recitations and drawing plates to train the technical imagination and power of visualization in three dimensions through the projection and successive revolutions of various solids.

2. DRAWING, FREEHAND SKETCHING AND ISOMETRIC.—Second term, Freshman year. Text-book—"Mechanical Drawing," Graves. 2 hours.

a. DRAWING.—Working drawings of machine details, screw threads, bolts, etc.; drawing of large structures taken from detail sketches and uncompleted views such as, bent for a timber trestle, timber highway bridge, built up steel columns and girders; tracing and blue printing.

b. FREEHAND SKETCHING.—Sketches of various machine details from which working drawings are made: a systematic study of dimensioning and line shading.

c. ISOMETRIC DRAWING.—Sketches and drawings of simple objects in isometric.

3. DESCRIPTIVE GEOMETRY.—First term, Sophomore year. Text-book—"Descriptive Geometry," Church and Bartlet. 2 hours. Problems on the point line and plane. Particular emphasis is laid on the necessity to mentally visualize the various problems.

4. DESCRIPTIVE GEOMETRY—MACHINE DRAWING.—Text-books—"Descriptive Geometry," Church and Bartlet, and notes on Machine Drawing. 3 hours.

a. DESCRIPTIVE GEOMETRY.—Generation and properties of surfaces of single and double curvature; warped surfaces; intersections and developments; shades and shadows, perspective, and a continuation of 2*c* in isometric.

b. MACHINE DRAWING.—A continuation of 2*b*. Freehand sketches of machine parts such as pulleys, shaft hangers, gate valves, eccentrics, etc.; details and assembly of a model water pump; from the sketches, drawings and tracings are made.

MATHEMATICS AND ASTRONOMY

Professors Hall, Smith, Marquard, Hatch and Messrs. Cawley, Snyder, and Spotts

It is strongly recommended that Algebra be thoroughly reviewed just before admission to college.

Students in the A.B. and Ph.B. courses who desire to take the advanced mathematics of the last two years must elect Sophomore mathematics.

1. ALGEBRA.—Quadratic equations, exponents, surds and imaginaries, ratio and proportion, variation, progressions, binomial theorem and logarithms. Required of Arts and Science Freshmen. First term. 3 hours.

2. SOLID GEOMETRY.—Required of Arts and Science Freshmen. Two-thirds of second term. 3 hours. 2 units.

3. ALGEBRA.—Ratio and proportion, variables and limits, binomial theorem, inequalities, indeterminate equations, choice and chance, logarithms, determinants, complex numbers, series and theory of equations. Textbook, Fite's *College Algebra.* Required of Engineering and Chemistry Freshmen. Ten weeks of first term. 6 hours. 4 units.

4. TRIGONOMETRY.—Required of Arts and Science Freshmen. One-third of second term. 3 hours. 1 unit.

5. TRIGONOMETRY.—Plane and Spherical Trigonometry. Textbook, Murray's *Trigonometry.* Required of Engineering and Chemistry Freshmen. Six weeks of first term. 6 hours. 2 units.

6. ANALYTICAL GEOMETRY.—Plane and Solid Analytic Geometry. Text-book, Phillips' *Analytic Geometry.* Required of Engineering and Chemistry Freshmen. Second term. 3 hours.

7. TRIGONOMETRY.—(Continuation of 4.) Plane and Solid Trigonometry. Required of Science Sophomores and elective for other Sophomores and Juniors. First term. 3 hours.

8. LABORATORY MATHEMATICS.—Applications of Mathematics and solution of practical problems. Text-book, Hall's *Mensuration* and reference books. Required of Engineering and Chemistry Freshmen. Second term. 1 hour.

10. ANALYTICAL GEOMETRY.—Required of Science Sophomores and elective for other Sophomores and Juniors. Second term. 3 hours.

11. DIFFERENTIAL CALCULUS.—Differentiation of all the functions of one or more variables, successive differentiation, implicit functions, development of functions, evaluation of indeterminate forms, maxima and minima, properties of curves and applications in mechanics. Text-book, Hall's *Calculus*. Required of Engineering and Chemistry Sophomores. First term. 3 hours.

12. INTEGRAL CALCULUS.—Integration of rational, irrational and transcendental functions, integration by parts and successive integration, rectification of curves, quadrature of plane surfaces, surfaces and volumes of solids, centers of gravity of lines, surfaces and solids, and moments of inertia. Text-book, Hall's *Calculus*. Required of Engineering and Chemistry Sophomores. Second term. 4 hours.

13. DIFFERENTIAL CALCULUS.—Elective for Arts and Science Juniors and Seniors. Text-book, Hall's *Calculus*. First term. 3 hours.

14. INTEGRAL CALCULUS.—Elective for Arts and Science Juniors and Seniors. Text-book, Hall's *Calculus*. Second term. 3 hours.

15. DIFFERENTIAL EQUATIONS.—Elective for Arts and Science Seniors. First term. 3 hours.

16. THEORY OF FUNCTIONS.—Elective for Arts and Science Seniors. Second term. 3 hours.

17. DESCRIPTIVE ASTRONOMY.—Fundamental definitions, parallax, refraction, the earth, the sun, the moon, eclipses and the planets. Text-book, Young's *Astronomy*. Elective for Arts and Science Juniors and Seniors. First term. 3 hours.

18. PRACTICAL ASTRONOMY.—The use of the sextant in determining time by a single altitude of the sun, by a single altitude of a star, by equal altitudes of the sun, by equal altitudes of a star; in determining latitude by the meridian altitude of a star in any position and by circummeridian altitudes. The instrument constants of the transit instrument and its use in deter-

mining longitude. The use of the zenith telescope in determining latitude. Elective for Arts and Science Juniors and Seniors. Second term. 3 hours.

20. ASTRONOMY FOR ENGINEERS.—The work includes a brief introductory course in general astronomy. This is followed by direct observations on the sun and polaris to determine latitude and azimuth. Azimuth is also found by means of the Burt and Saegmuller solar attachments. The students are trained to find latitude and time by means of the sectant. Second term. 3 hours.

PHYSICS

Professor Gordon and Messrs. Lockwood, Eichlin and Bryan

Physics is required of all students throughout the Sophomore year. Arts and Science students (except candidates for a degree of B.S. in Chemistry) take 1 and 2; Students of Chemistry, Civil Engineering and Mining Engineering take 3 and 4; students of Mechanical Engineering take 3, 4 and 6; students of Electrical Engineering take 3, 4, 5, and 6.

Courses 7 to 12 are elective for Arts and Science students in either Junior or Senior year. They constitute the work of those taking their Major in Physics. Any four of these six courses make a Minor in the subject.

Applicants for honors in Physics take 7 to 12 and either 13 and 14, or 15 and 16.

1-2. GENERAL COURSE.—Including Light, Sound, Mechanics, Heat, and Electricity. Lectures, recitations and laboratory. Sophomore year. First and second terms. 3 hours.

3-4. GENERAL COURSE.—For engineering and chemistry students. Lectures, recitations and laboratory. First and second terms. Sophomore year. 4 hours.

5. ELEMENTARY ELECTRICITY.—Required of students in Electrical Engineering course. Recitations and laboratory. Sophomore year. First term. 2 hours.

6. ELEMENTS OF ELECTRICAL ENGINEERING.—Required of students in Electrical and Mechanical Engineering courses. Lectures and recitations. Sophomore year. Second term. 2 hours.

7. APPLIED ELECTRICITY.—Study of direct currents, including lamps and electric lighting, dynamos and motors, storage batteries, methods of measuring and testing. Recitations and laboratory. Junior or Senior year. First term. 3 hours.
8. APPLIED ELECTRICITY.—Study of alternating currents, including effects of inductance and capacity, alternating dynamos and motors, transformers, and electric waves. Recitations and laboratory. Junior or Senior year. Second term. 3 hours.
9. ELECTRO-CHEMISTRY.—Theories of electric cells and electrolytic conduction and practical applications. Recitations and laboratory. Junior or Senior year. First term. 3 hours.
10. RADIOACTIVITY AND X-RAYS.—Conduction through gases, radioactive transformations and X-Rays. Lectures, recitations and laboratory. Junior or Senior year. Second term. 3 hours.
11. OPTICS.—Study of lenses, spectrometers, interferometers and polarimeters. Recitations and laboratory. Junior or Senior year. First term. 3 hours.
12. RECENT ADVANCES IN PHYSICS.—Lectures with presentation and discussion of recent advanced work. Junior or Senior year. Second term. 3 hours.

13–14. MATHEMATICAL PHYSICS.—Applications of mathematics to Physics. Recitations and lectures. Senior year. First and second terms. 3 hours.

15–16. THESIS WORK.—Experimental study of special problems with a thesis giving the results of the experiments and discussion of relation of the work to that of others. Senior year. First and second terms. 3 hours.

18. ELEMENTARY ELECTRICITY.—Given in 1915–16 only. For Juniors who have not had required course in Electricity and Magnetism. Recitations and laboratory. Second term. 3 hours.

20. OPTICS.—Given 1915–16 only. Senior year. Same as Course No. 11. Second term. 3 hours.

GROUP IV.—ENGINEERING

CIVIL ENGINEERING

Professor Porter, Professor Lyle, Assistant Professor Spengler, Messrs. Williams and Johnston

The course in Civil Engineering has been designed to develop the mental faculties of the student in those studies which form the foundation of all branches of Technology with additional training in the subjects classed as Civil Engineering. The course also includes general subjects, essential to a liberal education.

The graduate is prepared for immediate usefulness in the field and office, and, after a moderate amount of professional experience, to fill positions of trust and importance, not only in his chosen profession, but in allied work in mining, mechanical, electrical and architectural engineering.

The Department has a large equipment of instruments necessary for various branches of engineering field practice, including tapes, compasses, transits, levels, plane tables, barometers, standard base line tapes and pulling apparatus, sextants, solar attachments, chronometers, floats and current meters. A twelve-inch portable altazimuth instrument, reading to single seconds by micrometer microscopes, and provided with level for double zenith distances, is used for instruction in Geodesy and Practical Field Astronomy. A precision level of the latest design is employed in instruction in precise leveling.

The GENERAL TESTING LABORATORY contains one transverse machine of 400,000 pounds' capacity for specimens up to twenty-five feet in length and four feet in width, one 200,000-pound, three 100,000-pound screw testing machines and one 60,000-pound hydraulic testing machine arranged for tension, compression and transverse testing; a 4000-pound wire tester and a small machine for testing cord, twine, etc.; a 4000-pound transverse machine for specimens up to sixteen feet, and a smaller transverse machine for specimens up to five feet, arranged with micrometers for measuring deflections, and extension meters for measuring fiber deformations. The laboratory also contains a torsion machine of 125,000 inch-pounds capacity for specimens up to twenty feet in length and a 10,000 inch-pound torsion machine of the pendulum type for short specimens; a number of elongation meters of different types, compressometers and smaller micrometers, hand tools, etc., and apparatus for calibrating machines. There are also a number of special apparatus for shearing, punching, bending, etc., tests.

The CEMENT LABORATORY is fully equipped for conducting routine tests of cement according to the latest specifications together with apparatus for research work. The laboratory contains three 1000-pound machines for tension tests and one 2000-pound machine for compression and tension tests. There is also a machine for moulding briquettes under pressure and a power-driven Boehme hammer, ball mill and an automatic sieving apparatus. Each student is provided with a slate top mixing table and with cement and sand boxes, moist closet and necessary hand tools. The laboratory is further equipped with large immersion tanks with running water, cement bins, briquette racks, moist closets and all necessary apparatus to enable a number of students to work on the same routine tests during the same laboratory period.

The CONCRETE LABORATORY has a large mixing floor; storage bins for stone, sand and cement; a concrete immersion tank to accommodate beams fifteen feet in length; a beam crane and trucks of two tons' capacity; beam, compression and tension moulds; sieves, scales, mixing pans, measures, shovels, etc.

The ROAD MATERIAL LABORATORY contains equipment for performing the abrasion and absorption tests on paving brick (the transverse test of paving brick being performed in the GENERAL TESTING LABORATORY), and equipment for the durability test of road metal. This equipment consists of a brick rattler and a Deval abrasion machine, a drying oven, scales, immersion tanks, sieves, etc.

The HYDRAULIC LABORATORY contains a vertical pressure tank eighteen feet in height and five feet in diameter, arranged for making experiments on the flow of water through orifices and nozzles under heads up to three hundred feet, and provided with a device by which the orifice plates can be removed while the tank is under pressure; other smaller tanks for use under low heads; a standpipe sixty feet high; two tanks, thirty feet long for weir experiments and measurements of quantity; a turbine; impulse wheels; a centrifugal pump run by electric motor and provided with electric measuring instruments; rotary, disc and reciprocating water meters; a Venturimeter; a weighing tank; absolute and differential pressure gauges; and other appliances for the measuring of water used in experiments and for the testing of meters, motors, nozzles and fire hydrants; as well as arrangements for lecture-room illustrations. There is also connected with the laboratory a one-million gallon Worthington duplex pump.

The SHOP contains two lathes, a drill press, a planer, a milling machine, a grinder and other necessary appliances for preparation of test specimens, moldes and apparatus; and for repair work.

2. PLANE SURVEYING.—Theory relating to the construction and use of instruments. Field problems in the manipulation and use of chain, compass, transit and level. Area computations. Methods of Plotting. Text-book—Breed and Hosmer's *Plane Surveying*. Second term, Freshman year. 2 hours.

2*a*. SUMMER SCHOOL.—Recitations and lectures on Surveying Methods and Adjustments of Instruments. Practice in the adjustments of instruments. Students are divided into squads of six men. Each squad, in charge of an instructor, makes a survey of an area whose perimeter is approximately five miles, including all topography, and a profile of the bounding roads of the traverse. Upon completion of all field work each student is required to plot a map and profile. Three weeks in vacation at end of Freshman year.

3. TOPOGRAPHIC SURVEYING.—Recitations and lectures on the principles involved and methods employed in the use of the transit, stadia and plane table. Use of stadia slide rules, diagrams and tables. Determination of stadia constant. Surveys of portions of the College campus. Maps, locating contours and cross sectioning with Hand level. Contour problems. Text-books—Breed and Hosmer's *Surveying*, Vols. I and II. First term, Sophomore year. 2 hours.

4. RAILROADS.—Simple Compound, Reversed, Vertical and Transition Curves. Problems. Turnouts, connecting Tracks and Crossings. Field Problems. Paper location of a railroad. Construction of the profile. Estimate of quantities. Text-book—Allen's *Railroad Curves and Earthwork.* Second term, Sophomore year. 2 hours.

4*a*. SUMMER SCHOOL.—Railroad surveying. Reconnaissance. Preliminary survey, Paper and Final Location. Determination of grades, slope staking, and cross sectioning. Drawing of map and profile of a line approximately two miles long is made.

Through the coöperation of the officials of one of the railroads with the Department of Civil Engineering all students are given a practical course in Railroad Maintenance, the Summer School schedule being so arranged as to give each student one week of Maintenance work. The remainder of each student's time is equally distributed through all phases of the Location work. Three weeks in vacation at end of Sophomore year.

5. RAILROADS.—Methods of computing earthwork. Construction and use of tables and diagrams. Problems. Completion of Summer School Map and Profile. Computation of earthwork from notes of summer School survey. Mass diagram. Determination of necessary right of way. Area computations. Economic location. Construction and operation. Problems. Text-books—Allen's *Railroad Curves and Earthwork.* Webb's *Railroad Construction.* First term, Junior year. 3 hours.

6. GEODESY.—Construction and use of precision instruments. Geodetic surveying methods. Triangulation, precise leveling and base-line measurements. Solar observations. Computations. Field work. Text-book—*Breed and Hosmer,* Vol. II. Second term, Junior year. 3 hours.

7. APPLIED MECHANICS.—Statics. Forces, equivalence of force systems, centroids, general principles of equilibrium and application of the principles of equilibrium. Kinematics. Rectilinear and curvilinear motion, motion of a rigid body. Kinetics. Motion of a particle, and of a system of particles, translation

of a rigid body, rotation, work and energy. Text-book—Maurer's *Technical Mechanics.* First term, Junior year. 3 hours.

8. ROADS AND PAVEMENTS.—Location, construction and maintenance of town and country roads, city streets and pavements. Street cleaning. Text-book—Baker's *Roads and Pavements.* Second term, Junior year. 2 hours. For Laboratory work, see No. 28.

9. MECHANICS OF MATERIALS.—The principles of stress and strain; the behavior of materials under tension, compression and shearing; investigation and design of pipes, riveted joints, boilers and standpipes; strength and flexure of simple and cantilever beams. Report on the carrying capacity of a floor. Text-book—Merriman's *Mechanics of Materials.* First term, Junior year. 3 hours.

10. MECHANICS OF MATERIALS.—Continuation of 9. Restrained and continuous beams; columns; shafts. Impact and fatigue; true and internal stresses; mathematical theory of elasticity. Design of an I-beam highway bridge and of a steel standpipe. Text-book—Merriman's *Mechanics of Materials.* Second term, Junior year. 3 hours.

11. CEMENT.—The study of composition and method of manufacture of cement. Interpretation and method of performing different physical tests. Inspection and sampling of cement. Visit to cement mills. Standard methods of testing and specifications for cement. Text-book—Taylor's *Practical Cement Testing.* Materials, laws of proportioning, forms for concrete, making and placing of concrete, strength, weight, and cost, concrete building blocks and artificial stone. Text-book—Baker's *Masonry.* Second term, Junior year. 2 hours. For Laboratory work, see 27.

12. MASONRY.—Classification and properties of stone, building brick, common and hydraulic lime, sand, gravel and broken stone. Stone-cutting, stone and brick masonry. Ordinary and pile foundations. Foundations under water. Retaining

walls, bridge abutments, bridge piers and culverts. Textbook—Baker's *Masonry*. Second term, Junior year. 2 hours.

13. MASONRY DESIGN.—Design of a high masonry dam and masonry arch, using both graphical and numerical processes. Notes. First term, Senior year. 2 hours.

14. FRAMED STRUCTURES.—The theory and computation of stresses in simple roof and bridge trusses and towers, under dead, live and wind loads. Notes. Second term, Junior year. 2 hours.

15. ROOFS AND BRIDGES.—Continuation of 14. Railroad bridges under locomotive wheel, excess and equivalent loads. Stress sheets. Complete computations and design drawing for a wooden roof truss with bill of materials and estimate of cost. Complete computations and design drawing of a plate girder for railroad purposes, in accordance with standard specifications. Bill of materials, weights and estimate of cost. Textbook—Merrimann and Jacoby, Part I, and notes. First term, Senior year. 6 hours.

15*a*. ROOFS AND BRIDGES.—Same as 14, given to Mechanical Engineers only. First term, Senior year. 2 hours.

16. ROOFS AND BRIDGES.—The theory and computation of the stresses in continuous, partially continuous, draw and cantilever trusses, suspension bridges and arches. Complete computations and design drawing of a through pin connected railroad bridge in accordance with standard specifications. Bill of materials, weights and estimate of cost. Second term, Senior year. 6 hours.

17. SEWERAGE.—The disposal of sewage and garbage. The determination of the size and capacity of sewers, inlets and flush tanks. Construction methods. Text-book—Folwell's *Sewerage*. First term, Senior year. 2 hours.

18. SEWERAGE DESIGN.—Design of a sewer system for a small city with map and profiles. Notes. Second term, Senior year. 2 hours.

19. HYDRAULICS.—Hydrostatics, hydraulic instruments, orifices,

BRAINERD HALL.

weirs and tubes. Text-book—Merriman's *Hydraulics*. First term, Senior year. 2 hours.

20. HYDRAULICS.—Continuation of 19. Pipes, conduits; rivers; water power; dynamics; overshot, undershot and breast wheels; impulse wheels; turbines. Text-book—Merriman's *Hydraulics*. Second term, Senior year. 2 hours.

21. WATER SUPPLY.—The requisites for a good water; the available sources of supply; the construction of pumping plant, reservoirs and pipe lines; purification of water and its distribution to the public. Text-book—Turneaure and Russell's *Public Water Supplies*. First term, Senior year. 2 hours.

22. WATER SUPPLY DESIGN.—Design of a water-supply system for a small city. Notes. Second term, Senior year. 1 hour.

23. CONCRETE, REINFORCED.—Properties of material, contraction and expansion, fireproofing, steel requirements, concrete and steel in combination. The theory and design of slabs, beams, and columns. Text-book—Hool's *Reinforced Concrete Construction*, Vol. I. First term, Senior year. 2 hours. Not offered 1915–16.

25. GENERAL TESTING LABORATORY.—Study and use of testing machines. Commercial tension tests of iron and steel. Modulus of elasticity in tension and compression. Shear tests of iron and steel. First term, Junior year. 1 hour.

26. GENERAL TESTING LABORATORY.—Transverse tests of cast iron and wood; modulus of elasticity of steel in bending; tests of wooden columns; torsion tests of iron and steel; calibration of testing machines. Second term, Junior year. 1 hour.

27. LABORATORY, CEMENT.—Routine tests of Portland cements are made in accordance with the standard methods and specifications, the aim being to have the student become thoroughly acquainted with each standard test and to appreciate the significance of the results obtained. Special tests are also assigned to each student. Notes.

CONCRETE.—Mechanical analysis of the materials for concrete, proportioning and mixing, preparation of plain and reinforced concrete specimens for future tests. Notes.

REINFORCED CONCRETE.—Tests on plain concrete specimens to determine the stress deformation curve in tension and compression. Modulus of elasticity. Tests on reinforced beams to determine deflection and fiber stress distribution, location of neutral axis, and comparison of actual results with those given by various formulas. First term, Senior year. 1 hour. Not offered 1915–16.

28. ROAD MATERIAL LABORATORY.—Standard tests of paving brick and road metal. Second term, Junior year. Four single two-hour periods.

30. HYDRAULIC LABORATORY.—Tests are made on the circular orifice, the Venturi meter, water meters and weirs. Second term, Senior year. 1 hour.

32. THESIS.—A thesis is required of every student as a condition of graduation, upon a subject appropriate to and approved by the Department. All laboratories and other apparatus belonging to the Department may be used for thesis purposes. Second term, Senior year. 6 hours.

33. MUNICIPAL SANITATION.—Water Supply, Sewerage and Sewage Disposal, Street Cleaning and Garbage Disposal, from the viewpoint of the public health officer. First term, Sophomore year. 3 hours.

ELECTRICAL ENGINEERING

Professor Rood and Assistant Professor Tanzer

The object of the course in Electrical Engineering is to give thorough instruction in such branches of engineering, both general and electrical, as shall fit the graduate to successfully meet and solve the problems which come to him as practicing electrical engineer. To this end, stress is laid on the attainment of a broad engineering and scientific training rather than on the specialization along any particular line or lines of Electrical Engineering.

Beginning with the second term of the Sophomore year, the fundamental principles of Electrical Engineering are studied in the class room and worked out in the laboratory, the design room, and in problem work.

In Senior year attention is being paid to the direct application of the theories and principles thus arrived at, to the various phases of present-day commercial practice, consideration being given to the financial and commercial as well as the engineering side.

The graduate is in this way prepared to take up in an effective and intelligent manner any branch of electrical engineering requiring general or special electrical training.

The main electrical laboratory is thirty by sixty feet in dimensions, and is fitted up with representative types of continuous and alternating current generators and motors, lamp-banks, water rheostats, brakes, etc.; and the necessary instruments are supplied for loading and testing generators and motors.

The laboratories are supplied from the Easton Power Company's station, with two-phase, alternating current, at a frequency of sixty cycles. This current is available for testing purposes.

A fifty kilowatt motor-generator set has been installed for the purpose of supplying the laboratories with direct current. This set consists of a seventy-five horse power induction motor, directly connected to two twenty-five kilowatt, 120-volt direct current dynamos, the current from which is supplied to the laboratories by means of the three-wire system.

In case of need, direct current from the plant of the Easton Power Company is also available.

While designed primarily as a source of direct current, this motor-generator set is so installed as to be available at all times for experimental tests by the students.

A portion of the laboratories is fitted up for the more delicate tests required with the necessary instruments for accurate testing, among which are a Leeds and Northrup Potentiometer, a Thompson Quadrant Electrometer, D'Arsonval Galvanometers, Wheatstone Bridges, condensers, etc. Particular attention is paid to photometry of electric illuminants and specially fitted rooms have been provided for this work.

1. Alternating Current Engineering.—A study of alternating current circuits, apparatus and systems, single and polyphase. First term. Junior year. 3 hours.

3–4. ELECTRICAL LABORATORY.—A course in general electrical engineering testing. Throughout the Junior year. 2 hours.

5. ELEMENTS OF ELECTRICAL ENGINEERING.—An introductory study of direct and alternating current circuits, systems and apparatus. First term. Junior year. 2 hours.

6. MOTOR AND ILLUMINATING ENGINEERING.—A study of the application of electrical energy to motor and illuminating engineering. Second term. Junior year. 3 hours.

7–8. ELECTRICAL LABORATORY.—A continuation of Courses 3 and 4, covering advanced electrical engineering testing. Throughout Senior year. 2 hours.

9–10. ELECTRICAL LABORATORY.—A shorter course in electrical engineering testing. Throughout Junior year. 1 hour.

11. ELECTRIC POWER TRANSMISSION.—A study of electric transmission and distributing circuits and systems. First term. Senior year. 5 hours.

12. ELECTRICAL PROBLEMS.—The solution of problems relating to direct and alternating current engineering. Second term. Junior year. 2 hours.

13. ELECTRICAL DESIGN.—The design of direct and alternating current apparatus. First term. Senior year. 2 hours.

14. ELECTRIC RAILWAY ENGINEERING.—The engineering and economics of railway construction and operation. First term. Senior year. 3 hours.

16. ELECTRIC POWER PLANT ENGINEERING.—The study of the conditions affecting the design, erection and operation of electric power plants and substations. Second term. Senior year. 4 hours.

18. TELEPHONES.—A study of the modern telephone systems with a review of the early systems. Elective. Second term. Senior year. 3 hours.

20. STORAGE BATTERY ENGINEERING.—A study of the storage battery, its operation and its application in engineering. Elective. Senior year. 3 hours.

21–22. ENGINEERING ABSTRACTS.—The review and discussion of articles and papers of value in current engineering literature. Throughout Junior and Senior years. 1 hour.

24. Thesis Work.—A thesis is required of every student as a condition of graduation, the topic being assigned or approved by the head of the Department. The thesis must show the result of individual investigation and research. Second term. Senior year. 2 hours.

MECHANICAL ENGINEERING

Professor Fitch, Messrs. Pearce, Carpenter, Mitman and Flowers

The course in Mechanical Engineering aims to equip the student to handle general engineering problems. Courses in class room, drawing room, shops and laboratories, aim to give the student practice in the work that engineers are called on to perform, to enable him to base his work on principles and not on empirical formulae, and to give him the theory and practice necessary to deal intelligently with other men.

The class room work consists of lectures and recitations on the elements of engineering and leads later to more advanced work in the theory and design of machines, prime movers and power generators. A close study of the application of theory to practice is made, and illustrations of good practice are amply provided in the plants of the Lehigh Valley.

The work in the shops is given with the idea of teaching engineering principles and not manual training. Each student is required to keep the actual cost of every job assigned to him, a rate for his time being assumed.

The work in the engineering Laboratory will be given with the object of drilling the student in the experimental work which the engineer is called on to perform, as boiler, pump, engine tests, etc.

EQUIPMENT

The new Shop and Steam Laboratory is 102 feet wide, 183 feet long, and 40 feet from floor to peak of roof, and is constructed entirely of concrete, steel, brick, and glass, making a light, airy building, absolutely fireproof. Two partitions 8 feet high extend down the center of the large room, forming a passageway, to the left of which is the pattern and machine shop, and to the right the steam laboratory and instructors' offices. At the back of these are the forge shop, the foundry, and the boiler room, connected with each of which is a storage room for the material to be used, and a coal bunker. A large toilet room, supplied with hot and cold water and fitted with individual lockers, is provided in the basement for the convenience of the students.

The pattern shop is completely equipped with benches, lathes, hand saw, circular saw, planer, etc., and all the accessories necessary in an efficient shop.

The foundry is supplied with a cupola, a soft metal furnace, a core oven, ladles, flasks, and all tools necessary to make moulds and turn out practical castings in brass or iron.

The forge shop is equipped with student forges, all of the down-draft type, and a gas forge, anvils, and all of the tools used for the shaping and welding of metals by this process.

In connection with the forge shop there is a sheet metal and pipe shop equipped with the necessary tools to give instruction in sheet metal and pipe work.

The machine shop is fully equipped with vise benches for hand work, lathes, planers, shapers, milling machines, drill presses, power saw grinding machine, and all small tools to go with each of the machines. All are motor-driven, and direct-connected wherever possible, making a light shop, eliminating the danger of belts, and also furnishing a convenient means for testing any of the machines, or tools of various makes of steel, under different conditions of operation. The gears are encased to give greater safety to the operator.

The steam laboratory is to be equipped with standard types of steam engines installed to run condensing or non-condensing. Injectors, pumps, steam turbines, gas engines, and all instruments required for complete tests will be furnished. The boiler room will contain a fire tube and a water tube boiler, to furnish steam for the laboratory, and also to provide a convenient plant for instruction in firing, operating, and testing boilers.

All of the equipment is of full practical size of standard make, most modern design, and of a type that offers the greatest educa-

To be substituted for list of courses on page-87.

MECHANICAL ENGINEERING

1–2. SHOP "A."—A course in practical work, two periods per week, throughout both Sophomore and Junior years, in Foundry Practice, Pattern Making, Forging, Sheet Metal and Pipe Work, and Machine Shop Practice. 2 hours.

3–4. SHOP "B."—An elementary course in practical work, two periods per week, throughout Sophomore year, in Pattern Making, Foundry Practice, Forging and Machine Shop Practice. 2 hours.

5–6. HEAT ENGINEERING "A."—A course of lectures and quizzes, three periods per week, throughout Junior year, on Steam Engines, Steam Boilers, and the Principles of Thermodynamics. 3 hours.

7–8. HEAT ENGINEERING "A."—A continuation of Course 5–6; lectures and quizzes, three periods per week, throughout Senior year, on Steam Turbines, Internal Combustion Engines, Refrigeration and the Principles of Thermodynamics. 3 hours.

9–10. HEAT ENGINEERING "B."—An elementary course of lectures and quizzes, three periods per week, throughout Junior or Senior years, on Steam Engines, Steam Turbines, Internal Combustion Engines, and the Principles of Thermodynamics. 3 hours.

11–12. MACHINE DESIGN. A course of lectures and drawing periods, three periods per week, throughout Senior year, including a study of the motion of machines, design of gearing, of simple machines; power transmission; a study of the action of reciprocating parts. 3 hours.

14. INDUSTRIAL MANAGEMENT.—A course of lectures and quizzes, two periods per week, throughout the second term Senior year, on paying labor, cost keeping, organization, location of plants, contracts, specifications, etc. 2 hours.

16. BOILER DESIGN.—(1915–16 only.) A course of lectures and drawing periods on design of different types of boilers and accessories. One period per week, second term, Junior year. 1 hour.

18. THESIS.—A thesis is required of every student as a condition of graduation. The subject may be chosen by the student and must be approved by the Department.

tional advantages. Every care has been taken to make all of the equipment as safe as possible for the inexperienced student. Certain machines may be used only under the direct supervision of an instructor.

COÖPERATIVE COURSES IN MECHANICAL ENGINEERING

Commencing June, 1915, an optional course in coöperative engineering will be offered to those students who successfully complete the Sophomore Year. This course is so planned that one-half of the time of the course after Sophomore year, will be spent in industrial plants, thereby offering the best possible advantage for a student to associate theory with practice. The student is paid for his work while employed at the plants. The course covers the same amount of academic work as the regular course, and extends for three years after Sophomore year.

A special bulletin announcing this course may be obtained from the Registrar.

1–2. SHOP "A."—A course in practical work, two periods per week, throughout both Sophomore and Junior years, in Pattern Making, Forging, Sheet Metal and Pipe Work, and Machine Shop Practice. 2 hours.

3–4. SHOP "B."—An elementary course in practical work, two periods per week, throughout Sophomore year, in Pattern Making, Foundry Practice, forging, and Machine Shop Practice. 2 hours.

5–6. HEAT ENGINEERING "A."—A course of lectures and quizzes, three periods per week, throughout Junior and Senior years, on Steam Boilers, Mechanism of Steam Engines, Steam Turbines, Internal Combustion Engines, Refrigeration, and the Principles of Thermodynamics. 3 hours.

7–8. HEAT ENGINEERING "B."—An elementary course of lectures and quizzes, three periods per week, throughout Junior or Senior year, on Steam Engines, Internal Combustion Engines, and the Principles of Thermodynamics. 3 hours.

MINING ENGINEERING

Professor Marquard

The course leading to the degree of Bachelor of Science in Mining Engineering (B.S. in E.M.) Engineer of Mines (E.M.) is intended to give a general education and to prepare men for positions of responsibility in mining, metallurgy and general engineering. The policy of the Mining Department is to give thorough training in the underlying principles of mathematics, physics, chemistry, mineralogy, geology, metallurgy, surveying, mining engineering, and some practical knowledge in mechanical, civil and electrical engineering. With this fundamental training the mining graduates can successfully carry on specialized work and be rapidly advanced to positions of responsibility.

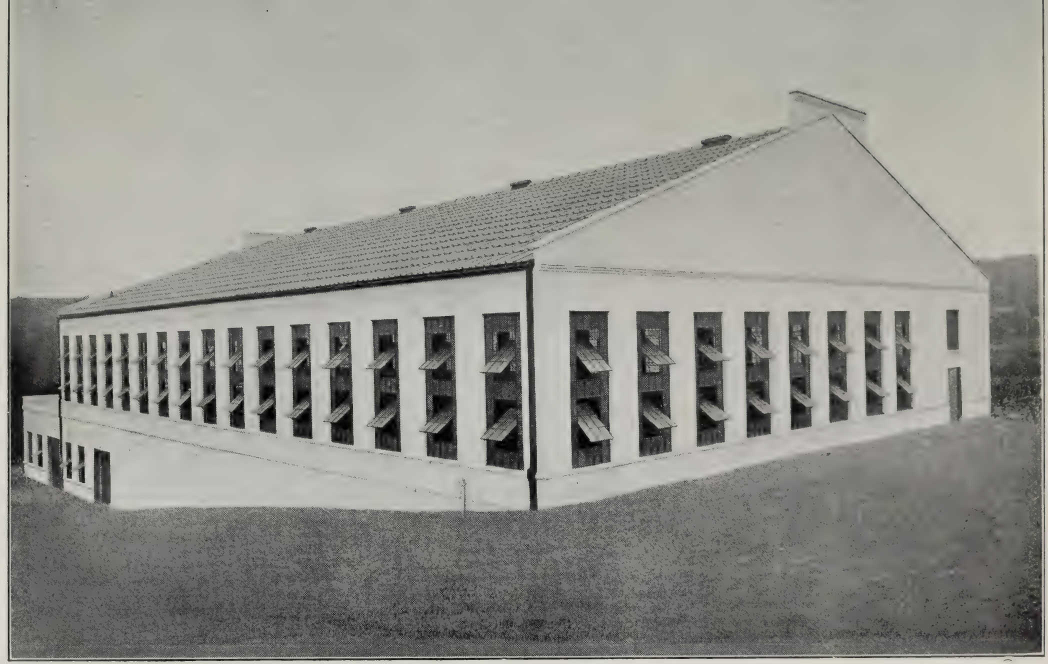
The training in geology consists of the study of mineralogy, crystallography, petrography, general and economic geology, and the geology of ore deposits.

The course in chemistry consists of lectures, recitations and laboratory work in organic chemistry, qualitative, quantitative and metallurgical analysis, blow-piping and assaying.

The study of Mining proper consists of courses extending throughout the Junior and Senior years and includes: mine surveying and problems, prospecting, deep boring, blasting, quarrying, shaft-sinking, drifting, tunneling, methods of mining and timbering, haulage, winding, ventilation, drainage, mining laws, mine and mill construction, ore dressing, metallurgy, mine machinery and mine administration.

The milling laboratory is a model concentrating plant that is fully equipped to crush, classify, separate and concentrate ores. The equipment consists of a Blake crusher, Cornish rolls, elevators, centrifugal pump, trommels, hydraulic classifiers, spitzkastens, a Wilfley shaking table, a slime table, New Century jigs, and a motor to supply power.

The mine gas analysis laboratory is well equipped to determine quantitatively the various mine gases by both titration and absorption methods.



MECHANICAL ENGINEERING LABORATORY AND SHOP.

All students in the mining course are required to take the three weeks' Summer school of surveying at end of Freshman year.

Two weeks in the Spring vacation of Junior and Senior years are spent in an actual mine survey, and in inspecting and studying the practical mining operations. Students are strongly advised to spend at least one Summer vacation during their course in actual work at the mines.

1. Mine Structures.—Study of stresses in beams, columns, girders and trusses by graphic statics. Masonry, foundations, and retaining walls. Shaft timbering. Square set timbering methods. Design of a mine gangway set, of flumes, trestles and roof trusses. First term, Senior year. 2 hours.
2. Mine Structures.—Design of ore bins, head frame, tipples and mill buildings. Second term, Senior year. 2 hours.
3. Mine Exploitation.—Open cut work. Hydraulic mining. Gold dredging. Coal mining methods. Metal mining methods. Stoping methods. Slicing, caving, filling, block caving, room and pillar methods of mining ore. Methods of mine development. Maps to illustrate. Salt mining. First term, Senior year. 2 hours.
4. Ore Dressing.—Hand picking. Principle of crushing, and concentration. Crushers: jaw and gyratory, rolls, stamps, Huntington mill, Chilean mill, arastras. Classifying machinery: trommels, grizzlies, shaking screens, hydraulic classifiers, settling ponds, spitzkastens. Concentrating machinery: jigs with theory of jigging, vanners, tables, magnetic concentrators, amalgamation. Second term, Senior year. 2 hours.
5. Mine Machinery.—Coal cutters, drills, hoists, cableways, motors, blast firers, air compressors. Theory of air compression and method of using and conducting compressed air. First term, Senior year. 2 hours.
6. Shaft Sinking.—Drifting, Tunneling. Shaft excavation and timbering. Location. Alignment. Level stations in the shaft. Special sinking methods: piling drums, freezing process, Triger's method, Kind-Cauldron system. Lippman's system. Tunneling methods in hard and soft rock. Systems of tunneling. Second term, Senior year. 2 hours.

8. Ventilation and Lighting.—Air in mines. Mine gases. Testing air. Analysis of mine gases. Natural, furnace ventilation. Positive blowers. Centrifugal fans. Theory and efficiency of fans. Measurement and control of air currents. Resistance of air ways. Explosions. Laws. Method of lighting. Safety lamps, electric lights. Laws. Second term, Senior year. 2 hours.

10. Mining Law.—Review of the mining laws of the various countries. General principles of real estate law with respect to minerals. United States mining laws. State laws and local regulations. Second term, Senior year. 2 hours.

12. Thesis.—A graduating thesis is required of each candidate for a degree. This thesis must be an original design or review of some process, machinery or plant related to mining operations. The subject of the thesis is assigned by the department along lines of special interest to the student. Second term, Senior year. 2 hours.

PHYSICAL TRAINING AND HYGIENE

Harold A. Bruce, Director of Athletics. Professor Kunkel, Lecturer on Hygiene

1. Lectures on Health and the General Principles of Physiology.—Illustrated with stereopticon views, charts, etc. First term. 3 hours a week for six weeks.

3–4. Physical Training.—Physical examination and assigned exercises in the Gymnasium. First and Second terms, beginning November 1st. 4 hours.

FEES AND EXPENSES

Tuition per year, Divisions I, II, and III	$100.00
Divisions IV and V (Engineering, Chemistry, and Premedical)	150.00
Incidental Fee for upkeep of grounds and buildings per year	25.00
Library Fee per year	15.00
Gymnasium Fee per year	5.00
Student Activities Fee, including membership in Athletic Association, admission to games, subscription to the Lafayette, etc., per year	10.00
Matriculation Fee (paid once only)	10.00
Graduation and Diploma Fee (paid once only)	10.00
Damage Deposit, per year, balance not used to offset public damage returned to student	2.00
Laboratory Fees for Material in Laboratory Courses, paid only by students taking laboratory courses:	
Biology, each laboratory course per term	3.50
Chemistry, each laboratory hour per week per term	1.50
Geology, each laboratory course per term	3.00
Mechanical Engineering Shop, per term	12.50
Physics, each laboratory course per term	5.00
General Testing Laboratory, per term	4.00
Electrical Engineering Laboratory, per term	7.50
Cement Laboratory, per term	1.00
Graphics, Material Fee, per term	0.50

All fees are to be paid to the Bursar, at the college office. Checks should be made payable to "Lafayette College."

The entire incidental, gymnasium and damage fees and one-half the tuition and other changes are due and payable at the beginning of the first term. Ten per cent penalty will be added to all bills not paid by October first. The balance of fees is due and payable at the beginning of the second term. Ten per cent penalty will be added to all bills not paid by March first. The matriculation fee is due upon filing certificate for admission.

Students entering after the middle of the term shall pay one-half of the tuition for the term. Students obliged on account of sickness to leave before the middle of the term may have refunded to them one-half of the tuition for the term; no reduction will be made to those leaving for any other cause.

Graduate students will be charged at the rate of ten dollars per hour per year with a minimum charge of $150 for the degree of Master of Arts or Master of Science, exclusive of laboratory charges for material. Graduate students do not pay other fees except Diploma Fee.

ANNUAL EXPENSES

Some money for books and other incidental expenses will be needed, but, with close economy, the total annual expenses—exclusive of clothing, traveling expenses and laboratory fees—need not exceed $400, as will be seen from the following summary:

	Liberal	Moderate	Minimum
Incidental fee	$ 25.00	$ 25.00	$ 25.00
Charge for College reading-rooms, gymnasium, etc.	20.00	20.00	20.00
Student activities fee	10.00	10.00	10.00
Board, 36 weeks, at $4.00 to $5.00	180.00	160.00	144.00
Rent of College-room, $24 to $99	99.00	49.00	24.00
Light and fuel	21.00	21.00	21.00
Washing	25.00	16.00	12.00
Books and stationery	48.00	40.00	20.00
	$428.00	$341.00	$276.00

Add tuition of $100 or $150 according to course of study.

Laboratory fees and damage assessments, which vary in amount, must also be added, while the personal expenses for clothing, etc., must be estimated according to individual experience. The first year will be made more expensive by the fee for matriculation, and furnishings for room. It is strongly recommended that parents furnish their sons with little beyond what will meet their necessary expenses.

SCHOLARSHIPS

ENDOWED SCHOLARSHIPS

ANDREW M. LOWRY SCHOLARSHIP.—This scholarship was founded by a bequest of twenty-five hundred dollars, the income to be used for the benefit of young men studying for the gospel ministry.

MARY ELL APPLEY FREE SCHOLARSHIP FUND.—Founded by a bequest of eighteen thousand three hundred dollars from Mrs. Luther Appley of Honesdale, Pa. The income to be used "in defraying the legitimate college expenses or so much thereof as in the opinion of the Trustees shall be for the best interests of the recipients, of poor deserving young men, residents of the Commonwealth of Pennsylvania, in attendance upon Lafayette College, as may be fitting themselves for the Christian ministry or the practice of medicine not exceeding three hundred dollars ($300.00) a year to each student." "These advancements to needy, deserving students to be received, retained and used by the recipients as a debt to honor, and whenever thereafter, in the practice of their several professions or otherwise, he shall be in receipt of an income more than sufficient to comfortably maintain himself and those legitimately dependent upon him, then to return annually thereafter without interest, such a part of the sum as each can do until the entire amount thus received has been returned to the Trustees aforesaid." At the time of making each advancement the Trustees shall take from each recipient a receipt therefore showing fully the amount received and the terms of the bequest.

CLASS OF 1880 SCHOLARSHIP.—Established June 1902 by the gift of two thousand one hundred and twenty-five dollars from members of the Class of 1880, the income to be applied to tuition.

H. B. SILLIMAN SCHOLARSHIP.—The income of $1000 held in trust by the College Board is to be applied on the tuition "of some male student who is a member of an Evangelical church, to be selected by the faculty for good scholarship, and active Christian influence.

with prospect of future usefulness, and under such other conditions as the faculty shall determine."

W. J. McCahan Scholarship.—Established in 1907 by a gift of two thousand dollars, the income to be applied to tuition.

John H. Converse Scholarship.—Established in 1908 by a gift of two thousand dollars from the late John H. Converse of Philadelphia. The income to be awarded to a "young man studying for the Christian ministry, without reference to denomination."

George E. Sterry Scholarship.—Established by the gift of two thousand dollars from the late George E. Sterry. The income to be applied to tuition.

Maitland Alexander Scholarship.—Established Dec. 31, 1908, by the gift of two thousand dollars from Rev. Maitland Alexander, D.D., of Pittsburgh. The income to be applied to tuition.

Edward Coleman Freeman Scholarship.—Established April 30, 1913, by the gift of fifteen hundred dollars each from Isabel G. Freeman, and Margaret C. Buckingham, in memory of Edward Coleman Freeman of the Class of 1879. The income to be applied to tuition.

Henry L. Davis Scholarship.—Established (1914) by the gift of one thousand dollars.

TRUSTEES SCHOLARSHIPS

Aid in the form of scholarship loans repayable in installments beginning five years after graduation is given to a limited number of young men of ability, industry and character, who would otherwise be unable to secure a college education. The amount of aid will depend upon the necessities of the applicant, but in no case will exceed the charge for tuition for students in Divisions I and II, nor half the charge for tuition for students in Civil Engineering, Electrical Engineering or Mining Engineering. No aid is available for students in Divisions III or V, nor for students in Mechanical Engineering.

Scholarships offered as prizes in certain schools will be under the same regulations as other aid. The perpetual scholarships issued to individuals prior to the establishment of the Scientific Department will provide free tuition in Divisions I and II and one-half tuition in the Technical Courses.

ROOMS AND BOARD

Unfurnished rooms in the College Dormitories, South Hall, East Hall, Blair, Fayerweather, Knox, Martien, McKeen, Newkirk and Powell rent for $24 to $144 a year for one or two persons. The additional charge for electric light is $9 per year and for steam heat $12 per year for each person. Applications for rooms should be made to the Superintendent of Grounds and Buildings, Albert M. Lane, at the College Office. Students are expected to room in the dormitories unless permission is granted to room elsewhere.

There are also thirteen fraternity houses on or near the college campus with rooms for about 200 students.

The college does not conduct a college commons or dining hall but furnishes facilities for eating clubs in the college dormitories. Board in these clubs, in boarding houses and in restaurants in the immediate vicinity of the campus, and in fraternity houses may be secured at $4 to $5 a week.

MEDICAL TREATMENT

A college physician has been provided for the benefit of the students and for the information of the college authorities and the parents of students in the case of serious sickness. This physician is John Edgar Fretz, M.D.

The regulations with regard to his attendance upon students are as follows:

The college physician shall make one call for diagnosis and prescription at the request and expense of the College. When called to see students he shall make a report of the diagnosis, with a recommendation of the course to be followed, to the Dean within twenty-four hours.

For continued attendance students may make their own arrangement with the college physician or some other physician approved by the college authorities. All calls after the call for diagnosis and all office calls shall be at the expense of the students.

When hospital treatment is required students will be cared for at the Easton Hospital unless otherwise directed by their parents or guardian.

BUILDINGS

The college grounds are situated upon the summit of a beautiful hill, overlooking the city of Easton. They are reached by a flight of stone steps, which ascend the bold front of the hill directly from the head of Third Street, or by electric cars, which skirt the face of the hill by a gradual incline. At the head of the steps stands the monument erected by the alumni association to their comrades who "died for the Union." The grounds contain about sixty acres terraced and laid out under the direction of Donald G. Mitchell. The buildings upon the campus are forty-two in number. The oldest of these is

South College

The central portion of this building was erected in 1833 and was the original college building. At later periods east and west wings were added and the whole building was thoroughly overhauled and modernized in 1909. It now contains a large part of the class and lecture rooms for the academic department, and the basement and first floor of the east wing have been fitted for a lecture-room and laboratory for the Department of Mining Engineering.

The first and second floors of the west wing have been occupied hitherto by the College Chapel. The remaining space in the main building and in the wings is devoted to dormitory rooms which have been thoroughly modernized, and every comfort afforded by modern plumbing and sanitary arrangements has been added. The building has also been beautified by a portico on the south front and by many improvements in the general finish of the building. The alterations have been intended to secure every needed improvement without altering the general effect of the building. The sentimental value of its historical place in the college life and thought has not been lost sight of.

Pardee Hall

The most commanding position on the campus is occupied by this building, the most conspicuous evidence of the liberality of the late Ario Pardee, which reached to every department of the college. Here the departments of civil and electrical engineering

MARTIEN, FAYERWEATHER AND POWELL HALLS.

are supplied with thoroughly equipped laboratories and lecture rooms, and the museums of these departments, and of general geology, mineralogy, and physics are to be found. The handsome rooms of the two literary societies are also in this building, and the central portion of the second and third floors of the main building contains an auditorium seating about six hundred in which the Commencement exercises, lectures, and other public entertainments are held. The auditorium is notable for a stained glass window erected as a memorial to the late Ario Pardee and President Cattell. The subject of the window is Charlemagne and Alcuin.

THE VAN WICKLE MEMORIAL LIBRARY

The Van Wickle Library Building, the gift of the late Augustus S. Van Wickle, was dedicated on May 30, 1900. It is constructed of Pompeian brick and terra cotta, and thoroughly furnished with the most approved modern appliances for library work. It contains two large reading rooms containing periodicals and reference books, a stack room, a librarian's room, and smaller rooms for special work.

The stack room, located on the northern side of the original building and conforming to it in its architecture, and fireproof, has accommodations for from eighty to ninety thousand volumes. This was the gift of Miss Marjorie Van Wickle, in January, 1911, when the library had grown to such proportions as to require additional storage room for its books.

JENKS HALL

This building was erected in 1864–'65 by the late Barton H. Jenks, of Philadelphia. Originally the home of all the natural sciences, it is now devoted entirely to the work of the Department of Biology, and contains laboratories, lecture rooms and museums.

THE GAYLEY LABORATORY OF CHEMISTRY AND METALLURGY

completed in 1902, is occupied by the departments of chemistry and metallurgy. The building consists of three stories, and is constructed of Indiana stone, colonial brick, and gray terra cotta. It is fireproof, with steel and cement floors, and is well equipped.

This building contains also the Henry W. Oliver Chemical and Metallurgical Library.

THE ASTRONOMICAL OBSERVATORY

erected as a memorial to the late Traill Green, M.D., was removed in 1915 to a new site north of Sullivan Road. In addition to the Observatory proper, it contains a lecture-room, with accommodations for the students in astronomy.

WEST COLLEGE

erected originally for the purposes of a practice school for the department of education, and famous for many years as the location of the classroom of Professor Francis A. March, now contains the offices of the president, the treasurer and the bursar of the College.

GYMNASIUM AND MARCH FIELD

The importance of physical culture was early recognized by this College and a gymnasium was erected in 1884 and placed under the direction of a competent instructor. The college has outgrown this building and a new gymnasium is urgently needed.

A splendid athletic field, known as March Field, has been secured through the efforts of the alumni. There is room in the enclosure for the football field, the baseball diamond, the quarter-mile track, and two field houses, together with stands accommodating about eight thousand people.

THE DORMITORIES

A complete reorganization of the dormitory system was effected in the summer of 1900 by the building of central structures, known as Knox and Fayerweather Halls, to connect Blair and Newkirk Halls and Martien and Powell Halls, respectively, and the facing of the completed buildings with mottled Pompeian brick, trimmed with red terra cotta. A complete sanitary plumbing system of baths, sinks and closets, steam heat and electric lights have been installed in all the buildings. These dormitories together with East College and South College furnish accommodations for students.

INFIRMARY

A small building on McCartney Street immediately adjoining East College has been set apart for the use of students suffering from contagious diseases. This building has but rarely been called into service, but on several occasions has served to prevent the extension of contagion by the isolation of single cases of diphtheria and scarlet fever which have occurred. For non-contagious cases of a serious character, the excellent hospital of the city offers the best modern conditions of treatment.

BRAINERD HALL

This building for the Y. M. C. A., the gift of J. Renwick Hogg, Esq., '78, of the Board of Trustees, was erected in 1902. It is a three-story gray stone building in the Tudor Gothic style. It contains a large room for the meetings of the society, and reading, writing, and committee rooms; also a trophy room of the athletic association, a room for the collection of curios from foreign missionary fields, and bowling alleys in the basement.

Its object is to afford a home under active Christian influences for all forms of student life.

MECHANICAL LABORATORY AND SHOPS

This building erected for the Department of Mechanical Engineering is 102 feet by 185 feet, of steel and concrete construction, and contains, on the main floor, a wood-working shop 45 feet by 75 feet, a machine shop of the same dimensions, and a laboratory 45 feet by 150 feet, for steam and gas engineering. In the rear are a forge shop and foundry 40 feet by 45 feet each, boiler and storage rooms, lockers and lavatories.

CENTRAL STEAM PLANT

During the autumn of 1909 a central steam plant was established with a power house built of stone with a concrete roof containing large boiler and storage rooms with every convenience for the running of the plant. The power house is equipped with four 150-horsepower boilers.

FRATERNITY HOUSES

Eight national fraternities have chapter houses on the college campus under agreement with the Board of Trustees. These are in order of their erection, Delta Kappa Epsilon, Theta Delta Chi, Phi Delta Theta, Zeta Psi, Chi Phi, Delta Upsilon, Delta Tau Delta and Phi Gamma Delta. Phi Kappa Psi also has a house facing the campus. Sigma Chi, Sigma Nu, Omega Delta Phi and Alpha Chi Rho rent houses in the neighborhood of the campus. These houses all furnish rooms for eight to eighteen men each, and table board for all their members.

PROFESSORS' RESIDENCES

There are fourteen houses for members of the Faculty on the campus. The fact that provision is made for residence upon the campus of so large a proportion of the students and faculty makes possible a community life which is a valuable part of the college.

THE MEMORIAL CHAPEL

A new chapel to seat eight hundred persons, the gift of an anonymous donor, is now in course of erection. It is expected that it will be ready for use at the opening of the college year, September, 1916. It is built of gray limestone, in the Georgean style.

LIBRARIES AND READING-ROOM

The College Library is located in the Van Wickle Memorial Library Building, previously described. It was established at the foundation of the College in 1832 and has had a steady growth. It is largely made up of books bearing directly on the courses of instruction.

It contains a large and valuable collection of the publications of the Early English Text Society, presented by the Class of 1871, a fine collection of books of English literature, given by the Class of 1875, and a collection of four hundred and fifty volumes in American literature, given by the Class of 1892. It also includes a collection of books and pamphlets written by the students, faculty, alumni and trustees of the College, called "The Lafayette Library" and representing the literary activities of Lafayette men.

This unique and valuable collection now numbers six hundred and thirty-three titles and includes almost a full set of the College catalogues, Commencement addresses and official publications.

The reading-room is supplied with well selected papers and periodicals, general and technical, in different languages. It also contains a papyrus scroll, five feet long, from a mummy case at Thebes, with a hieratic inscription in the characters of 1050 B.C.—pronounced by Seyffarth the finest he had seen—presented by the late Hon. John W. Garrett, of the Class of 1837; also a full length portrait of Lafayette, by Healey, presented by the late Dr. Thomas W. Evans; also a large collection of portrait prints and medals of Lafayette, presented by the late President William C. Cattell, D.D., LL.D.

In the Van Wickle Memorial Library Building will be found the Ward Library also, the gift of the heirs of C. L. Ward, Esq., of Towanda, Pa., which is largely made up of books of history and political science.

The Henry W. Oliver Chemical and Metallurgical Library, founded by the gift of $5000 by Henry W. Oliver, of Pittsburgh, Pa., and enlarged by gifts from Prof. Edward Hart and others, and containing the College collection of chemical books, is located in the Gayley Chemical and Metallurgical Building. This library recently received from a friend of the College all the pamphlets, about three thousand, belonging to the library of the late Prof. Johannes Wislicenus, of the University of Leipsic.

The literary societies of the College have in their Halls libraries numbering about six thousand volumes, largely of a literary character, valuably supplementing the other libraries.

The class of 1871 has given to the College a fund, the proceeds of which are to be used for the purchase of the publications of the Early English Text Society.

The class of 1875 at its reunion in 1905 by the gift of one thousand dollars established an alcove in the library to be known as "The Francis A. March Alcove."

The class of 1892 at its decennial reunion in 1902 established an alcove in the library devoted to American literature.

SCIENTIFIC COLLECTIONS

These are extensive and valuable, and are rapidly increasing from year to year by gifts from societies and individual donors, and by special appropriations in addition to the fees for matriculation.

The apparatus in the department of physics and applied mechanics, the instruments used in the departments of astronomy and engineering, and the scientific equipment of the numerous and extensive laboratories meet the demands of advanced instruction in these departments.

GENERAL INFORMATION

ATTENDANCE

Attendance on all college exercises is required. Weekly reports of absences from all exercises are made to the Registrar. When this number, for any student, reaches fifteen he is warned. When it reaches twenty, he and his parents are notified. When it reaches thirty, he is suspended indefinitely from college. Absences may be permitted by the Dean of the College if caused by illness of two consecutive days or longer or for other urgent reasons when requested by parents or guardian. Such permitted absences will not be counted in the totals just mentioned, but the student will be expected to make up the work lost. Absence from any recitation during the three days immediately preceding or following the Thanksgiving, Christmas, Mid-Year or Spring recess is counted as two absences and the student is debarred from further attendance upon recitations in that subject until he secures permission from the Dean to re-enter the course. Absence from morning chapel is counted as a half absence and from Sunday church as two absences.

No student is permitted to take less than fifteen or more than twenty units of work per week without special permission from the Committee upon Attendance and Standing.

EXAMINATIONS

Examinations are held at the close of each term on the studies of that term. Reports of the scholarship of students, determined by the results of the term examinations and of the daily recitations combined—three times the weight being given to the daily recitations that is given to the term examinations—are made to parents at the end of each term.

STANDING

Students entering with conditions are required to make them up before the end of the Freshman year.

Conditions in course not removed before the beginning of the term second after that in which the condition was received shall be counted as a failure; if a required subject, the course must be repeated, and in other cases either repeated or an extra subject scheduled.

If at the beginning of any college year a student has conditions in course aggregating sixteen or more units he is dropped to the next lower class.

GRADUATION

Students who have pursued an entire course as prescribed and have successfully passed their examinations are recommended to the trustees for the first academic degree in course. Such recommendations are ordinarily acted upon and the degrees are conferred at Commencement, at which time the students receive diplomas from the President of the College. At Commencement the faculty awards such honors as it sees fit to those who are to receive degrees. These honors ordinarily consist of a valedictory oration, a Latin salutatory, and other honorary orations and theses.

DEGREES

The degrees granted by the College upon successful completion of the respective courses are *Bachelor of Arts* (A.B.), *Bachelor of Philosophy* (Ph.B.), *Bachelor of Science* (B.S.) for students in the divisions of Liberal Arts and Pure Science.

The degrees granted in Engineering are *Bachelor of Science* in Chemical Engineering (B.S. in Chem. E.), *Bachelor of Science* in Civil Engineering (B.S. in C. E.), *Bachelor of Science* in Electrical Engineering (B.S. in E. E.), *Bachelor of Science* in Mechanical

Engineering (B.S. in M. E.), *Bachelor of Science* in Mining Engineering (B.S. in E. M.). The degree granted to Chemists is *Bachelor of Science* in Chemistry (B.S. in Chem.).

MASTERS' DEGREES

MASTER OF ARTS.—The degree of *Master of Arts* may be conferred one year after graduation on any *Bachelor of Arts or Philosophy* who has pursued a prescribed course of study, equivalent to sixteen recitations per week, during one year in residence, passed the examinations, and presented a satisfactory thesis.

The same degree may be conferred two years after graduation on any *Bachelor of Arts* of Lafayette College who shall have devoted at least one year exclusively to advanced study under the direction of the faculty, passed examinations in the studies pursued, and presented a satisfactory thesis. An examination must be held at the College at least once in each college term. Theses must be presented for approval not later than May 1st.

MASTER OF SCIENCE.—The degree of *Master of Science* may be conferred upon *Bachelors of Science* upon the same conditions as those noted above for the degree of *Master of Arts*.

TERMS AND VACATIONS

The College year is divided into two terms. The first term begins on the Thursday nearest to September 12 and continues for twenty weeks. The second term begins on the Monday following the close of the first term and continues for eighteen and a half weeks. Holidays and vacations are as announced in the calendar on page 4 of this bulletin.

COMMENCEMENT

The annual Commencement usually falls on the third Wednesday in June. The three days immediately preceding Commencement Day are set apart for special exercises. On Sunday, the first of these days, a Baccalaureate sermon is preached in the College chapel at eleven o'clock in the morning; and in the evening a sermon is preached in the auditorium of Pardee Hall before the

Brainerd Society of the College by some distinguished minister selected by the Society.

On Monday the Senior class holds its Class Day exercises on the campus.

The alumni and literary societies hold their reunions on Tuesday. The annual oration before the Phi Beta Kappa Society is given Tuesday evening.

The regular Commencement exercises are held in the auditorium of Pardee Hall on Wednesday morning, the afternoon being occupied by the alumni dinner. All these exercises are open to the public. Various other exercises of an athletic or social nature are conducted on the part of the students.

PRIZES

THE FRANCIS A. MARCH PRIZE IN ENGLISH

A prize of thirty dollars in books was given from 1862 to 1881 by the late Rev. William C. Fowler, LL.D., of Durham, Connecticut, and since 1881 has been continued under the title of "The Francis A. March Prize."

This prize will be awarded to the student of the Junior or Senior class passing the best examination and presenting the best essay upon the language of some English classic.

The subject in 1916 will be the works of Edgar Allen Poe.

EARLY ENGLISH TEXT PRIZE

A prize, consisting of books of the Early English Text Society, of London, is given to that student of the Junior or Senior class who shall, at the close of the year, pass the best examination in "English before Chaucer." The examination is based upon selected texts announced from year to year, and will be awarded in 1917.

This prize was founded by the gift of $364 by the class of 1871.

THE CLASS OF '83 PRIZE

A prize of the value of fifteen dollars is annually awarded to that member of the Sophomore class who shall have attained the highest standing in Trench on the Study of Words, the work carried on in connection with the introductory course in the study of the English language.

This prize was founded by the gift of $315 by the class of 1883 at their graduation.

THE GILBERT PRIZE IN OLD ENGLISH

By the will of Howard Worcester Gilbert, who died in Chester County, March 5, 1895, a bequest was left to the College amounting to $1002, with the provision that a gold medal of the value of forty dollars should be awarded every two years to the student writing the best essay on the Old English Language and Literature, beginning with Beowulf, in the earliest Anglo-Saxon period, and extending down to the year 1070. Should the competitors be of equal merit, preference is to be given to residents of Pennsylvania.

The medal is an inch and three-fourths broad, three-sixteenths of an inch thick, and contains on its face a relief portrait of King Alfred with the date 871–901, surmounted by the Anglo-Saxon phrase, "Naes he gold hwaete." The reverse shows a garland encircled with the legend, "Howard Worcester Gilbert Old English Prize. Founded 1895." Space is left for the name of the recipient.

This prize will be awarded in 1917. It is open to competition of students of Anglo-Saxon in the graduate course of 1916–1917. The essay must be handed in by May 1, 1917.[1]

THE SHAKESPEARE PRIZE

A prize of books is awarded to that member of the Junior class who passes the best general examination upon Shakespeare, his works, life, character, etc.

THE R. B. YOUNGMAN GREEK PRIZE

The class of 1884, at its vigintennial reunion, subscribed the sum of $500, the income of which is to be awarded to that member of the Sophomore class who shall attain the greatest proficiency in Greek.

NOTE.—In all cases where a prize is awarded to an essay or oration the successful competitor must hand to the proper authority two typewritten copies of his production before receiving the prize, if he is requested to do so.

THE PARK PRIZE IN LATIN

A prize of fifteen dollars for the Latin Department is offered by Mr. Samuel R. Park, A.M., '84. In 1916 it will be awarded on the work of the second term Freshman class, for excellence in Horace.

THE BLOOMBERGH PRIZE

The class of 1888 offers annually a prize of forty dollars to that member of the Junior class who shall attain the greatest proficiency in the study of the French and German languages and their literatures.

THE JAMES ALEXANDER PETRIE PRIZE IN FRENCH

A prize of the annual value of $50 has been put at the disposal of the College as a memorial to the late James Alexander Petrie, M.D., of Phillipsburg, New Jersey. It will be awarded to that member of the Junior class who shall attain the greatest proficiency in the Department of Romance Languages.

HISTORICAL ESSAY PRIZE

A prize consisting of a copy of his work, "*The Marquis de Lafayette in the American Revolution,*" is given annually by Charlemagne Tower, Jr., LL.D., of Philadelphia, to that member of the Senior class who shall, on or before the first day of October, present the best essay on some subject connected with the relations of *France and the United States*. The essay must not exceed three thousand words in length.

THE B. F. BARGE GOLD MEDAL

A prize of a gold medal of the value of $100 was founded by Benjamin F. Barge, Esq., of Mauch Chunk, Pa., to be awarded to that member of the Senior class who shall deliver the best oration in an annual contest to be held on Memorial Day, May 30th. The contestants, not more than six in number, are to be chosen by a committee of the faculty from those members of the Senior class, who shall hand in orations on or before May 1st upon topics assigned by the committee not later than March 25th of each year.

PRIZES IN ORATORY

The Washington and Franklin literary societies appropriate one hundred dollars a year for prizes in oratory. Four contestants are chosen from each Hall to take part in the Junior Oratorical Contest, which is held in May. In the presence of a public audience three judges, approved by the faculty, hear the speakers and award the prizes. Their decision is based on the merit of the performances as to originality and force, with reference both to composition and delivery. The first prize is fifty dollars, the second prize thirty dollars, and the third prize twenty dollars.

COLEMAN BIBLICAL PRIZE

Prizes, each of the value of ten dollars, are awarded to those students of the Freshman class who have attained the highest standing in the several divisions of Biblical study in that year.

These prizes were founded by the Rev. Lyman Coleman, D.D., in 1880.

THE ASTRONOMICAL PRIZE

A prize of thirty dollars in gold is awarded to the student making the greatest progress in the study of astronomy in the Senior year.

MATHEMATICAL PRIZE

Two prizes, of the value of twenty dollars each are offered to those students of the Sophomore class who shall have exhibited during the first two years of the course the greatest proficiency in the study of Mathematics. In 1914 these prizes were given to students in the Technical division and in 1915 they were awarded to students in the division of Arts and Sciences and hereafter they will be awarded in alternate years to students in the two Mathematical courses.

These prizes were founded, as was the Astronomical prize above mentioned, in 1867, by Professor Traill Green, M.D., LL.D.

BARGE MATHEMATICAL PRIZES

By the bequest of the late Benjamin F. Barge, Esq., of Mauch Chunk, three prizes of a total value of one hundred dollars have been established for excellence in mathematical studies. These prizes are awarded to members of the Sophomore class for excellence in the solution of original problems. In 1914 these prizes were given to students in the division of Arts and Sciences, and in 1915 they were awarded to students in the Technical division, and hereafter they will be awarded in alternate years to students in the two mathematical courses.

'85 PRIZE IN PHYSICS

The class of 1885 founded a prize in 1897 by a gift of $500, the annual income of which is given to that member of the Junior class who attains the highest rank in the studies of physics.

THE CHEMICAL ESSAY PRIZE

A prize of five dollars in books is awarded each term to that member of the Junior or Senior class who shall present the best term theme on some chemical subject.

CIVIL ENGINEERING PRIZE

A prize of the value of fifty dollars, the gift of Carrol Phillips Bassett, C.E., Ph.D., of the class of 1883, is annually awarded to that member of the graduating class who presents the best graduating thesis and attains the highest standard of scholarship in the Civil Engineering Course.

RELIGIOUS INSTRUCTION

Lafayette College aims to be distinctly Christian and is related to the Presbyterian Church not only historically and legally but by hearty accord in spirit and purpose. Religious instruction is carried on with a view to the development of Christian manhood and leadership in Christian service, not in any sectarian sense, but in full accord with essential truth as accepted by all evangelical Christians. Instruction in the Bible has always held a prominent place in the college and an effort is now being made to secure an adequate endowment for this department.

Prayers are held each morning in the chapel at 7.50 and services in the chapel Sunday mornings at 11 o'clock. All students are expected to attend these services. Where there is some exceptional reason assigned by the parents, students will be permitted to attend one of the churches in Easton instead of the Sunday morning service. This permission will be granted only on request of parents and for sufficient reason.

Special sermons are preached before the college from time to time by distinguished ministers. The preachers for 1915–1916 are:

1915

Sept. 19th—Rev. Samuel A. Martin, D.D., Professor of Philosophy, Lafayette College.

Sept. 26th—Rev. Henry M. MacCracken, D.D., LL.D., Chancellor Emeritus of New York University.

Oct. 3rd—Professor W. B. Owen, Ph.D., Litt.D., Lafayette College.

Oct. 10th—Rev. George Alexander, D.D., Pastor of University Place, Presbyterian Church, New York City.

Oct. 17th—Rev. James M. Farr, D.D., Wilkes-Barre, Pa.

Oct. 24th—Rev. Daniel H. Overton, D.D., '88, Pastor of Islip Presbyterian Church.

Oct. 31st—Rev. Benjamin T. Marshall, D.D., Professor of Biblical Literature, Dartmouth College, Hanover, N. H.

Nov. 7th—Bishop Ethelbert Talbot, D.D., LL.D., South Bethlehem, Pa.

Nov. 14th—Rev. Arthur J. Brown, D.D., Secretary of Board of Foreign Missions, New York City.

Nov. 21st—Rev. E. A. McAlpin, Jr., Madison, N. J.

Dec. 5th—Bishop William F. McDowell, D.D., LL.D., Chicago, Ill.

Dec. 12th—Rev. S. Edward Young, D.D., Pastor of Bedford Presbyterian Church, Brooklyn, N. Y.

Dec. 19th—Rev. William E. Brooks, Allentown, Pa.

1916

Jan. 9th—Rev. Charles Stelzle, D.D., New York City.

Jan. 16th—Rev. Walter Rauschenbusch, D.D., Professor of Church History, Rochester Theological Seminary, Rochester, N. Y.

Jan. 23rd—Rev. James A. Kelso, D.D., President of Western Theological Seminary, Pittsburgh, Pa.

Jan. 30th—Rev. John M. Thomas, D.D., President of Middlebury College, Middlebury, Vt.

Feb. 13th—Rev. Harold M. Robinson, D.D., Pastor of Market Square Presbyterian Church, Germantown, Pa.

Feb. 20th—Rev. J. Ross Stevenson, D.D., LL.D., President of the Theological Seminary, Princeton, N. J.

Feb. 27th—Rev. Minot C. Morgan, D.D., Summit, N. J.

March 5th—Rev. Robert B. Jack, Hazleton, Pa.

March 12th—Rev. W. W. Edge, Brainerd Union Church, Easton, Pa.

March 19th—Rev. Hugh Black, D.D., Union Seminary, New York City.

March 26th—Rev. Maitland Alexander, D.D., Pittsburgh, Pa.

April 9th—Rev. Frank W. Sneed, D.D., Pastor of East Liberty Presbyterian Church, Pittsburgh, Pa.

April 16th—Rev. Charles R. Erdman, D.D., Professor in the Theological Seminary, Princeton, N. J.

April 30th—Rev. Samuel V. Holmes, D.D., Pastor of Westminster Presbyterian Church, Buffalo, N. Y.

May 7th—Rev. John McDowell, D.D., Pastor of the Brown Memorial Church, Baltimore, Md.

May 14th—Rev. John R. Davies, D.D., Philadelphia, Pa.

May 28th—Rev. Henry Sloane Coffin, D.D., Pastor of the Madison Ave. Presbyterian Church, New York City.

LECTURES

In addition to the lectures given in connection with the respective departments lectures upon subjects of general interest are given upon Wednesday afternoon before the whole student body. Some of the lecturers for the year are

October 6.—Mr. S. Roland Hall, of the Alpha Cement Co., on "Advertising."

October 14.—Professor H. H. Horne, of New York University, on "The Call to Teach."

November 10.—Dean A. Holmes, of State College, on "Dynamic Ideas."

November 17.—Mr. Henry B. Faber, of New York, on "Applied Imagination in Engineering."

December 1.—Dr. Edward Breck, of the Navy League of Washington, on "Our Navy and What It Means."

December 8.—Professor Chauncey B. Tinker, of Yale University, a reading from Lamb and Kenneth Grahame.

December 15.—Professor Joseph French Johnson, of the School of Commerce of New York University, on "Economic and Financial Problems of the Present War."

January 12.—Professor John A. Lomax, of the University of Texas, on "Cowboy Songs and Ballads."

January 19.—Mr. Herman L. Collins ("Girard"), of the Philadelphia *Ledger*, on "Making a Newspaper."

March 1.—Dr. Harvey W. Wiley, of Washington, D. C.

March 29.—Mr. James B. Curtis, of New York, on "College Fraternities."

COLLEGE SOCIETIES

THE PHI BETA KAPPA SOCIETY

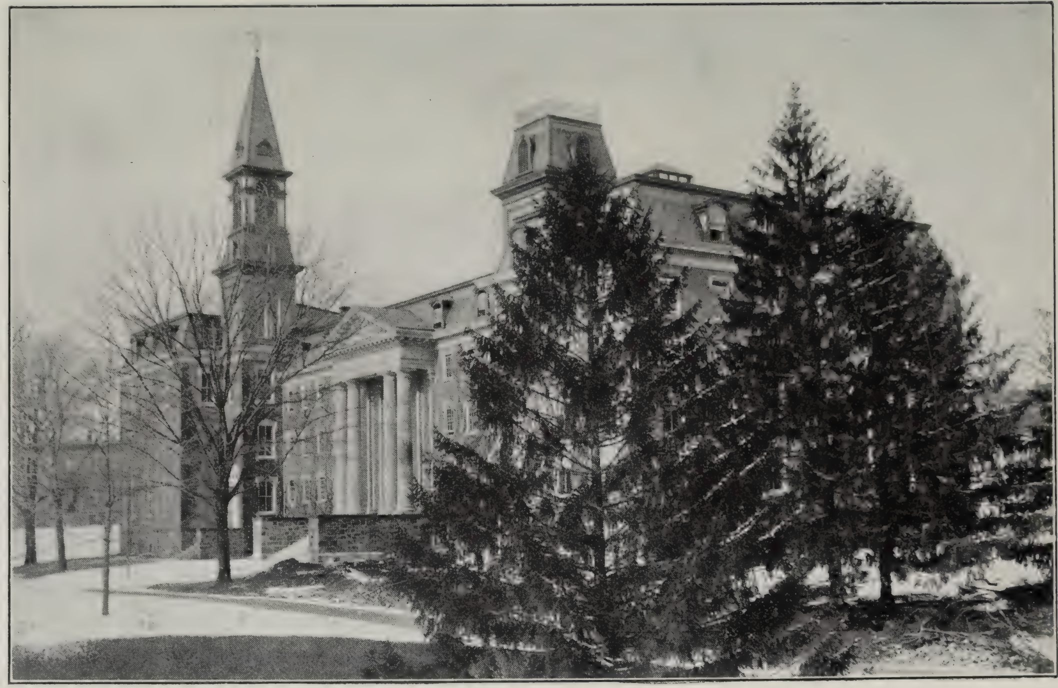
A chapter of the Phi Beta Kappa fraternity known as the Gamma chapter of Pennsylvania was established at Lafayette College in 1889. Students of high standing are elected to membership in their Senior year.

LITERARY SOCIETIES

The *Washington* and *Franklin* societies were organized early in the history of the College and are conducted by the undergraduates. Both societies have well-furnished apartments in Pardee Hall, and valuable libraries. They meet every Wednesday evening for literary exercises, consisting of orations, essays, and debates. A generous rivalry for College honors exists between them, and each year representatives of the two societies from the Junior class engage in a public contest in oratory. On the day before Commencement the societies hold reunion meetings in their halls. These societies are an important part in College life and work, and *all students are strongly advised to join them.*

YOUNG MEN'S CHRISTIAN ASSOCIATION

The voluntary religious interests of the students are fostered by



SOUTH COLLEGE

the college Y. M. C. A. 1832 marked the beginning of this work in Lafayette when the Brainerd Society, named in honor of David Brainerd, devoted missionary to the Indians of this section, was formed. Originally devoted to the promotion of the cause of missions, its work has since broadened to include associated religious interests. In 1877, when the intercollegiate movement of the Y. M. C. A. began to assume such a great place in the Christian activities of the land, Brainerd Society became affiliated with it. The original name, however, was retained and the organization is now known as Brainerd Society of the Young Men's Christian Association. The Association enjoys the use of a large building upon the campus, erected in 1902 at a cost of $45,000. This building is the gift of Mr. James R. Hogg, of the class of 1878, and is utilized exclusively for student activity purposes. The Association aims to create a wholesome religious atmosphere among the students and to enlist them in some form of Christian service on the campus, and in the city of Easton and vicinity.

BIOLOGICAL SOCIETY

The *Biological Society* is for the purpose of making its members intelligent concerning the important biological questions of the day, enabling them to appreciate the value of research in nature. The membership consists of those students of the three upper classes who are either prospective or present members of the classes in biology, and of such graduate students as are interested in the laws of life comprehended through the natural history sciences.

CHEMICAL CLUB

A *Chemical Club* has been organized by the students, for reading and discussing papers contained in the current chemical magazines, and to listen to lectures from visiting chemists.

DEUTSCHER VEREIN

The *Deutscher Verein*, which is open to all students who are interested in German life, language and literature, meets at frequent intervals for lectures, singing, discussions, social intercourse and practice in speaking German. A dramatic entertainment in the German language is given during the year.

CIVIL ENGINEERING SOCIETY

A society organized to advance the study of prominent engineering works.

SOCK AND BUSKIN

A society organized for the production of plays and the promotion of interest in dramatic literature. A play is given annually during the second term and repeated at commencement.

LAFAYETTE COLLEGE BAND AND ORCHESTRA

A College band was organized in 1910 and is maintained by the students under the direction of Mr. F. W. H. Freeman.

LAFAYETTE COLLEGE MUSICAL ASSOCIATION

A Glee Club and a Mandolin Club are maintained by the students, and concerts given from time to time.

ATHLETICS

College athletics are under the direction of the Director of Athletics appointed by the Board of Trustees and the Faculty's Committee on Athletics. Teams are maintained by the students in football, baseball, soccer, tennis, basketball, wrestling and track athletics. No student may participate in intercollegiate athletics as a member of a college team unless the written consent of his parents or guardian has previously been filed with the Registrar.

COLLEGE PUBLICATIONS

The College Bulletin is published quarterly by the College and includes the annual catalogue, the annual reports of College officers, the annual alumni announcements, and other announcements as required. It will be sent free upon request addressed to the Registrar.

The Lafayette is published weekly during the college year as a newspaper by the students of the College. The subscription price is two dollars a year.

The Melange is published annually by the Junior class as the College annual, and contains a record of all student organizations. The price is two dollars.

DEGREES CONFERRED

HONORARY DEGREES

June 16, 1915

DOCTOR OF DIVINITY.—Rev. John A. MacCallum, Philadelphia, Pa., Pastor of the West Walnut Street Presbyterian Church; Rev. Walter Waygood, Philadelphia, Pa., Assistant Secretary of the American Bible Society.

DOCTOR OF LAWS.—Joseph Buffington, Pittsburgh, Pa., Judge of the United States Circuit Court of Appeals, Third Judicial District; Cyrus E. Woods, '86, Greensburg, Pa., Secretary of the Commonwealth of Pennsylvania; S. Lewis Ziegler, M.D., Philadelphia, Pa., Director of Public Health and Charities, City of Philadelphia.

DOCTOR OF LETTERS.—Alden March, '90, New York City, Sunday Editor of the New York *Times;* Harvey Maitland Watts, '86, Philadelphia, Pa.

MASTER OF ARTS.—George B. Nevin, Easton, Pa.; Calvin Franklin Smith, Easton, Pa.

CIVIL ENGINEER.—Henry B. Baker, New York City.

October 20, 1915

DOCTOR OF LETTERS.—Martin Grove Brumbaugh, Harrisburg, Pa., Governor of the Commonwealth of Pennsylvania; Ernest Gottlieb Sihler, New York, N. Y., Professor of Latin in New York University; Ethelbert Dudley Warfield, Chambersburg, Pa., President of Wilson College.

DOCTOR OF SCIENCE.—Frank Henry Constant, Princeton, N. J., Professor of Civil Engineering in Princeton University; Henry Fay, '89, Cambridge, Mass., Professor of Analytical Chemistry in the Massachusetts Institute of Technology; Richard Mills Pearce, Jr., Philadelphia, Pa., Professor of Research Medicine in the University of Pennsylvania.

DOCTOR OF LAWS.—Francis Shunk Brown, Philadelphia, Pa., Attorney-General of the Commonwealth of Pennsylvania; Winston Churchill, Cornish, N. H.; Thomas DeWitt Cuyler, Philadelphia, Pa.; Elbert Henry Gary, New York City, Chairman of the United

States Steel Corporation; Edward Kidder Graham, Chapel Hill, N. C., President of the University of North Carolina; Thomas Hastings, New York City; Albert Ross Hill, Columbia, Mo., President of the University of Missouri; Robert MacKenzie, New York City, Secretary of the College Board of the Presbyterian Church in the United States of America; John C. Sharpe, Blairstown, N. J., Head Master of Blair Academy; Joseph Ross Stevenson, Princeton, N. J., President of Princeton Theological Seminary, Moderator of the General Assembly of the Presbyterian Church in the United States of America; Oswald Garrison Villard, New York City, President of the New York Evening Post Company.

DEGREES IN COURSE

June 16, 1915

BACHELOR OF ARTS.—David Rhea Coffman, Scotland; Alfred Lobb Jeffery, Pa.; William Harrison Johnston, Pa.; Horace Algert Lehr, Pa.; John Kennedy Maxwell, Pa.; George Roland Miller, Jr., Pa.; William McKee Moffat, Ind.; Roy Thomas Robling, Pa.; Millard Fillmore Staples, Pa.

BACHELOR OF PHILOSOPHY.—Stuart Welsh Adler, N. Y.; William Ruthrauff Amberson, Pa.; William Ross Andre, Pa.; Wilbur Aaron Bryan, N. J.; Richard Griffith Burn, Pa.; Paul Leo Clugston, Pa.; Donald Otto Coughlin, Pa.; Merrill Boswell Davis, N. J.; John James Egan, Jr., N. J.; Henry Rudolph Finger, Pa.; Wilson Baughman Gaither, Pa.; Dudley Able Giberson, Pa.; Edgar Thomas Hammer, Pa.; James Monroe Hess, Jr., Pa.; Charles Wood Horr, N. J.; Gordon Lee, Pa.; Warren Bryan Mack, Pa.; Otto May, Pa.; Lewis Matten Prutzman, Pa.; Barron Peard Rex, N. J.; Carl Fawcett Scharpf, Pa.; Walter James Scott, N. J.; Ralph Faust Shaner, Pa.; Foster Bryon Snowden, Pa.; William Joel Spry, Pa.; Benjamin Cornell Stevens, Pa.; William Perry Tallman, N. J.; James Donohoe Toole, Pa.; George Willever Walton, Pa.; James Jamieson Waygood, Pa.; Russell Stanley Woglom, N. J.; T. L. Killough, N. J., '14.

BACHELOR OF SCIENCE.—George Garwood Brown, N. J.; Joseph Ignatius Diamond, Pa.; Charles Clark Evans, Pa.; Edgar Miller

Furry, Pa.; Martin Thomas Hagerty, Jr., N. J.; Emory Wilbur Helfrich, N. J.; William Cassedy Mecray, N. J.; Paul Virchow Speer, Pa.; Lea Danenhower Williams, D. C.; Cornelius Lane Wells, Pa.

BACHELOR OF SCIENCE IN CHEMISTRY.—Lester Marshall Curtiss, Conn.; Frederick King Davidson, N. J.; Dwight Moody Decker, Pa.; Nelson David Langenbach, Pa.; Arthur Jefferson Lockard, Pa.; Walter Seeley Mallory, Jr., Pa.; Arthur Leon Meyer, N. J.; Carl Nicholas Miller, Jr., Pa.; Frank Jacob Seibert, Pa.; Arthur Anders Schultz, Pa.; Harold William Sloyer, Pa.; Lewis Grant Teetsell, N. Y.; Gilbert Allen Woods, Pa.

CIVIL ENGINEER.—Edgar Maurer Anderson, Jr., N. J.; Andrew Gustave Bissett, D. C.; Charles Sherwood Boyce, N. Y.; Edwin Douglass Boyce, N. Y.; William Lukens Edwards, Pa.; Frank Arthur Ernst, N. J.; Howard Hanks, N. Y.; Randall Francis Holden, D. C.; Harold West Johnson, N. Y.; Harry Edward Jones, Conn.; John R. Kenyon, N. Y.; George Washington Krick, Pa.; John Swivel Leister, Pa.; Shipman Roseberry Pursel, N. J.; Frank Marshall Sweeney, Md.

MINING ENGINEER.—William Hazel Collins, D. C.; Alexander Weikel Jordan, Pa.; Ralph Andrew Schilling, Pa.

MECHANICAL ENGINEER.—Kenneth Hendrick Colville, Pa.; Robert Edmonston Ellis, N. J.; William George Keat, Pa.; John Heiks Paul, Pa.; Jules Darius Roberts, Jr., Texas.

ELECTRICAL ENGINEER.—Howard Strong Conklin, Jr., N. Y.; William Johnson English, Jr., N. J.; James Henry Kennedy, Pa.; Joseph Homet Kerrick, Pa.; Walton Barr Killough, N. J.; Paul Morley Lee, N. Y.; LeRoy Lefferson, N. J.; Charles Raymond Lohman, Pa.; Robert Dallas McManigal, Ohio; William Hunter Powell, Pa.; Ernest Elwin Smith, Pa.; Robert Smith Soles, Pa.; Lyman Charac VanInwegen, N. Y.

MASTER OF ARTS.—G. Nickel, A.B., '13; D. W. Phillips, A.B., '05.

MASTER OF SCIENCE.—J. R. Hess, Ph.B., '07; Z. R. Howell, Ph.B., '07 (in absentia).

DOCTOR OF PHILOSOPHY.—A. Roberts, Ph.B., M.S., '99.

COMMENCEMENT DISTINCTIONS, 1915

HONORS.—George Roland Miller, Jr., Easton, Pa.; William Rose Andre, Stroudsburg, Pa.; Wilbur Aaron Bryan, Hackettstown, N. J.; Paul Leo Clugston, Waynesboro, Pa.; Merrill Boswell Davis, Boonton, N. J.; Ralph Faust Shaner, Pottstown, Pa.; Andrew Gustave Bissett, Washington, D. C.; Warren Bryan Mack, Flicksville, Pa.; George Willever Walton, Berwick, Pa.

ORATIONS.—Charles Clark Evans, Berwick, Pa.; Henry Rudolph Finger, Wilkes-Barre, Pa.; Dudley Able Giberson, Easton, Pa.; Arthur Jefferson Lockard, Easton, Pa.; Arthur Leon Meyer, Trenton, N. J.; Walter James Scott, Collingswood, N. J.; Frank Jacob Seibert, Easton, Pa.; Harold William Sloyer, Easton, Pa.; William Perry Tallman, Phillipsburg, N. J.; Russell Stanley Woglom, Perth Amboy, N. J.

PRIZES AWARDED

SENIOR PRIZEMEN

THE ASTRONOMICAL PRIZE: Wilbur Aaron Bryan, Hackettstown, N. J.

THE B. F. BARGE PRIZE IN ORATORY: William Harrison Johnston, Philadelphia, Pa.; Honorable mention of William R. Amberson, Waynesboro, Pa.

CIVIL ENGINEERING PRIZE: Divided between Andrew G. Bissett, Washington, D. C., and Howard Hanks, New York, N. Y.

JUNIOR PRIZEMEN

THE CLASS OF '85 PRIZE IN PHYSICS: Floyd McPherson Felmly, Phillipsburg, N. J.

THE BLOOMBERGH PRIZE IN GERMAN: Bernard Sol Hoffenstein, Wilkes-Barre, Pa.

THE JAMES ALEXANDER PETRIE PRIZE: Divided between Frederick Augustus Glisencamp, Mount Tabor, N. J., and Ray DeWitt Herring, Pen Argyl, Pa.

THE JUNIOR ORATORICAL PRIZES:

FIRST: John Hannanial Dyer, Scranton, Pa.

SECOND: Robert Lee Logan, Philadelphia, Pa.

THIRD: Thomas Arthur Willians, Fullerton, Pa.

THE CHEMICAL ESSAY PRIZES: George Lenher Alexander, Everett, Pa.

SOPHOMORE PRIZEMEN

THE TRAILL GREEN MATHEMATICAL PRIZES:

FIRST: Kenneth Merry Bixler, Easton, Pa.
SECOND: Robert Earle Bacon, Bridgeton, N. J.

THE B. F. BARGE MATHEMATICAL PRIZES:

FIRST: Arthur R. B. Stern, Philadelphia, Pa.
SECOND: John Kay Christmas, Easton, Pa.
THIRD: Harry Lawrence Ramage, Florida, N. Y.

THE EARLY ENGLISH TEXT SOCIETY'S PRIZE: Maxwell McKeen, Easton, Pa.

THE CLASS OF '83 PRIZE IN ENGLISH: Kenneth Merry Bixler, Easton, Pa.

THE LOUNSBURY PRIZE IN CHAUCER: Joseph Alexander McCurdy, Philadelphia, Pa.

THE R. B. YOUNGMAN GREEK PRIZE: Roger Hunt Blake, Trenton, N. J.

FRESHMAN PRIZES

THE PARK PRIZE IN LATIN: Leon E. Lewis, Mahanoy City, Pa.

THE LYMAN COLEMAN BIBLICAL PRIZES:

DIVISION A: Guy Arthur Bensinger, Ashland, Pa.
DIVISION B: Calvin Leonard Burton, Los Angeles, Cal.
DIVISION C: Samuel Douthert, Jr., East Orange, N. J.
DIVISION D: Walter Gehret Kleinspehn, Reading, Pa.
DIVISION E: Charles Gerald Palmer, Pen Argyl, Pa.
DIVISION F: Edwin Smyser Strawbridge, York, Pa.

THESES PRESENTED BY CANDIDATES FOR DEGREES IN THE ENGINEERING AND CHEMICAL COURSES

1. Design of Sewerage System and Sewage Disposal Plant for Lansdale, Pa.

   WILLIAM LUKENS EDWARDS, Pa.

2. Plans and Estimate of Cost for the Double Tracking of a Portion of the Easton and Northern Railroad.
    CHARLES SHERWOOD BOYCE, N. Y.
    EDWIN DOUGLAS BOYCE, N. Y.
    FRANK ARTHUR ERNST, N. J.
    RANDALL FRANCIS HOLDEN, D. C.
3. The Effect of Repeated Loads on Simple Cast-Iron Beams.
    JOHN R. KENYON, N. Y.
4. The Physical Properties of Concrete as Affected by the Method of Mixing.
    EDGAR MAURER ANDERSON, JR., N. J.
    HARRY EDWARD JONES, Conn.
5. Strength of Bond between Slag Concrete and Plain Steel.
    FRANK MARSHALL SWEENEY, Md.
    JOHN SWIVEL LEISTER, Pa.
6. Investigation for a Garbage Disposal Plant at Phillipsburg, N. J.
    SHIPMAN ROSEBERRY PURSEL, N. J.
7. The Testing of Steel for Elastic Properties by Continual Application of Loads.
    HAROLD WEST JOHNSON, N. Y.
8. Investigation of the P. R. R. Locomotive Turntable at Phillipsburg, N. J.
    GEORGE WASHINGTON KRICK, Pa.
9. The Design of a Water Supply System for the Towns of Johnsonville, Mt. Bethel and Portland.
    ANDREW GUSTAVE BISSET, D. C.
    HOWARD HANKS, N. Y.
10. Acetic Acid from Calcium Acetate.
    LESTER MARSHALL CURTISS, Conn.
11. Nitration of Benzine.
    FREDERICK KING DAVIDSON, N. J.
12. Ammonium Acetate from Ammonium Sulfate and Calcium Acetate.
    DWIGHT MOODY DECKER, Pa.

13. Cerous Oxalate.
    ARTHUR JEFFERSON LOCKARD, Pa.
14. Barium Hydroxide.
    NELSON DAVID LANGENBACH, Pa.
15. Ilmenite.
    WALTER SEELEY MALLORY, JR., Pa.
16. Potassium Tellurate.
    ARTHUR LEON MEYER, N. J.
17. Acetone from Calcium Acetate.
    CARL NICHOLAS MILLER, Pa.
18. Anilin from Nitrobenzene.
    ARTHUR ANDERS SCHULTZ, Pa.
19. Ceric Sulfate.
    FRANK JACOB SEIBERT, Pa.
20. Uranic Nitrate.
    HAROLD WILLIAM SLOYER, Pa.
21. Heat Treatment of Coal.
    LEWIS GRANT TEETSELL, N. Y.
22. Nitric Acid from Calcium Nitrate.
    GILBERT ALLAN WOODS, Pa.
23. Wood Alcohol.
    JOHN ROYDEN HESS (1907), Pa.
    (For the Degree of M.S.)
24. The Drainage of the Black Creek Coal Basin.
    WILLIAM HAZEL COLLINS, D. C.
    GROVER CLEVELAND LESSER, Pa.
25. Development of an Hypothetical Magnetic Mine.
    RALPH ANDREW SCHILLING, Pa.
    ALEXANDER WEIKEL JORDAN, Pa.
26. Comparative Methods of Direct Current Design.
    WALTON BARR KILLOUGH, N. J.
27. The Testing of an Alternating Current Machine, Equipped with Revolving Field, Slip-Ring and Squirrel-Cage Rotors.
    ROBERT DALLAS McMANIGAL, O.
    WILLIAM HUNTER POWELL, Pa.
    CHARLES RAYMOND LOHMAN, Pa.

28. A Study and Comparison of the Waterside Stations of the New York Edison Company and the 201st Street Station of the United Electric Light and Power Company.
    Lyman Charac Van Inwegen, N. Y.
    Howard Strong Conklin, Jr., N. Y.
29. A Study of Thin Insulating Materials.
    Ernest Elwin Smith, Pa.
    Robert Smith Soles, Pa.
30. An Investigation of the Current Consumption on the Lines of the Easton Transit Company, the Northampton Traction Company, and the Lehigh Valley Transit Company.
    Paul Morley Lee, N. Y.
    Joseph Homet Kerrick, Pa.
    James Henry Kennedy, Pa.
31. The Relation of Speed, Pressure and Current Density to Electric Brush Losses.
    William Johnson English, Jr., N. J.
    Leroy Lefferson, N. J.
32. Fuel Consumption Tests on Secor Kerosene Generator Unit, 3.5 K. W., Using Injection of Water with Fuel.
    Kenneth Hendrick Colville, Pa.
    Jules Darius Roberts, Jr., Texas.
33. The Effect of Temperature on the Heat Treatment of Tool Steel, Using Water, Fish Oil and Barium Chloride.
    Robert Edmonston Ellis, N. J.
    John Heiks Paul, Pa.
34. An Investigation of the Strength of Cast-Iron Gear Teeth.
    William George Keat, Pa.

THE ALUMNI ASSOCIATIONS

The Alumni Association is composed of graduates of the College, and such former students as left College before graduation in good standing as may be elected. The annual meeting is held on Tuesday preceding Commencement Day.

The Association has the privilege of nominating every alternate year two members of the Board of Trustees, who hold office for six years. In June, 1914, Charles Heebner, '78, of Philadelphia, and J. George Becht, '90, of Harrisburg, were chosen. In the Spring of 1916 two more will be voted for.

The officers of the Association for 1915–16 are President, George W. W. Porter, '85; Vice-President, Cyrus E. Woods, '86; Secretary and Treasurer, J. F. Stonecipher, '74.

The Executive Committee is as follows: Chairman, McCluney Radcliffe, M.D., '77; R. F. Whitmer, '85; F. R. Drake, '86; J. W. Fox, '88; Thomas Fisher, '88; George D. McIlvaine, '89; Ernest G. Smith, '94; George A. Sigman, '05; Edward G. Chalfant, '95.

It is desirable to keep up the full record, so long maintained, of the residences, occupations, literary efforts, and public services of the alumni and former students of the College.

Information is solicited in regard to these points, and also in reference to matters appropriate to the obituary record, which is annually prepared, for the Alumni Association.

Each alumnus is asked to send his personal record, carefully revised to date, to the Secretary before May 1, 1916.

BRANCH ASSOCIATIONS

NORTHEASTERN PENNSYLVANIA

Charles L. Bryden, '02, Scranton	*President*
Oscar J. Harvey, '71, Wilkes-Barre	*Secretary*

PHILADELPHIA AND VICINITY

Bernard J. Myers, '01, Lancaster	*President*
Charles B. Adamson, '77, 222 Walnut St., Phila	*Secretary*

NEW YORK AND VICINITY

JESSE GRANT ROE, '87, 120 Broadway, N. Y. City........*President*
DUDLEY E. LATHAM, 165 Broadway, N. Y. City.........*Secretary*

THE WEST BRANCH

FRED H. PAYNE, '88, Williamsport....................*President*
R. FLEMING ALLEN, '90, Williamsport.................*Secretary*

CENTRAL PENNSYLVANIA

JOHN E. FOX, '85, Harrisburg ....*President*
FRANK P. SNODGRASS, '90, Harrisburg...........*Acting Secretary*

WESTERN PENNSYLVANIA

THOMAS W. POMEROY, '96, 1403 Benedum-Trees Building, Pittsburgh..................................*President*
EDWARD G. CUNNINGHAM, '13, 1659 Frick Building, Pittsburgh.......................................*Secretary*

HAZLETON

W. S. AYRES, '72, Hazleton, Pa.......................*President*
J. E. ANDERSON, '94, Hazleton, Pa....................*Secretary*

CHICAGO AND VICINITY

NATHAN GRIER MOORE, '73, Chicago, Ill...............*President*
TRACY D. LUCCOCK, '05, 801 Manhattan Bl., Chicago, Ill..*Secretary*

WASHINGTON, BALTIMORE AND VICINITY

WALTER B. GUY, '05, Fendall Bldg., Washington, D. C...*President*
ELI SWAVELY, '96, 4101 Connecticut Ave., Washington, D. C...*Secretary*

ROLL OF STUDENTS 1915–1916

GRADUATE STUDENTS

Kenneth Cushing Grinslade	Biology	Lafayette '12
Fred Nathan Miller	Biology & Pedagogy	Lafayette '14
Martin Thomas Hagerty, Jr.	Biology	Lafayette '15
Harold John Lockwood	Physics	Lafayette '13
Charles Garfield Eichlin	Physics	Lafayette '13
Wilbur Aaron Bryan	Physics	Lafayette '15

SENIOR CLASS, 1916

NAME.	COURSE.	RESIDENCE.	ROOM.
John Quincy Adams	C.E.	Easton	819 Spring Garden
George Lehner Alexander	Ch.	Everett	68 B.
Karl Janeway Ammerman	M.E.	Scranton	Δ Υ
Harold Wilbur Bailey	E.E.	Milburn, N. J	Φ Γ Δ
John Watts Baer Bausman, Jr.	B.S.	Lancaster	Δ K E
Joseph Shakespeare Beddall	Ch.	Tamaqua	Σ X
Harvey MacKnight Black	A.B.	Easton	129 Pierce
Daniel McMichael Blackburn	M.E.	Easton	807 Wood
Earl Andrew Brinker	Ch.	Easton	415 High
Clarence Jenkins Brown	Ph.B.	Lakewood, N. J	134 M.
Hugh Jackson Bubb	B.S.	Williamsport	Δ K E
Richard Cameron Cain	Ch.	Berwick	Δ T Δ
Thomas Derby Carey	A.B.	Moosic	72 B.
Charles Samuel Clark	C.E.	Binghamton, N. Y	Φ K Ψ
Robert Nesbitt Clark	A.B.	Wilkes-Barre	99 McK.
George Nathaniel Cohen	C.E.	Washington, D. C.	522 New
Floyd Hoff Compton	M.E.	Springtown, N. J	39 S.
William Eugene Delaney, Jr.	Ph.B.	Williamsport	X Φ
Theodore Mulford Doan	B.S.	Berwick	Φ Δ Θ
Colin Tolmie Dodd	B.S.	Phillipsburg, N. J., Home,	32 Chambers
John Earle Donmoyer	B.S.	Lebanon	Δ Υ
Sydney Fetherman Downs	M.E.	Easton	118 Parsons
Frederick Drexel	C.E.	Brooklyn, N. Y	609 High

NAME.	COURSE.	RESIDENCE.	ROOM.
Alfred Hall Drummond	E.E.	Easton	67 B.
John Hannaniah Dyer	Ph.B.	Scranton	99 McK.
Isaac Dill Everitt	M.E.	Hackettstown, N. J.	Φ Δ Θ
Lloyd McPherson Felmly	Ph.B.	Phillipsburg, N. J., Home,	5 Front
Harold Davies Fernau	Ph.B.	Jeddo	Φ Δ Θ
Clarence Welch Forshee	B.S.	Glenwood, N. J.	Φ Δ Θ
Harry LaTourette Foster	Ph.B.	Brooklyn, N. Y.	Σ Ν
Louis Rodman Fox	E.E.	Easton	Ζ Ψ
George Swift Freeman	G.S.	Easton	501 Lafayette
Theodore Freeman	L.	Easton	501 Lafayette
Sylvio de Campos Freire	C.E.	Sao Paulo, Brazil	Φ Γ Δ
Russell Harrison Fritz	M.E.	High Bridge, N. J.	65 B.
John Henry Gaffin	C.E.	Wyoming, N. Y.	136 McC.
William Joseph Gaynor	Ph.B.	Phillipsburg, N. J., Home,	76 Fayette
Frederick Augustus Glisencamp	Ph.B.	Mount Tabor, N. J.	33 S.
Harman Reasoner Goldthwaite	B.S.	Marion, Ind.	Ζ Ψ
Walter Berton Grigsby	C.E.	Washington, D. C.	Χ Φ
Herbert Newlin Hartman	Ph.B.	Wilmington, Del.	151 P.
Francis Ogden Hathaway	C.	Deposit, N. Y.	63 B.
Philip Showalter Hench	A.B.	Pittsburgh	142 P.
Ray DeWitt Herring	A.B.	Pen Argyl	33 S.
Christian Aaron Hess	Ch.	Stroudsburg	Knox St.
Bernard Sol. Hoffenstein	Ph.B.	Wilkes-Barre	16 S.
Paul Hacke Hugus	Ph.B.	Latrobe	Φ Κ Ψ
Frederick Blackburn Hunt	E.E.	Trenton, N. J.	39 S.
John Rexroth Irwin	Ph.B.	McConnellsburg	64 B.
Homer Miller Jacobs	Ph.B.	Pottstown	34 S.
Sedgwick Kistler Johnson	Ch.	Tannersville	114 McK.
Harry Melick Keller	Ch.	Stroudsburg	83 N.
William Irwin Kocher	Ph.B.	Easton	R. D. No. 2
Russell Stewart Kramer	E.E.	Easton	724 Coleman
Kenneth Wolfinger Kressler	Ph.B.	Easton	13th and Butler
John Raymond Kuechel	C.E.	Elizabeth, N. J.	142 P.

NAME.	COURSE.	RESIDENCE.	ROOM.
Paul Angier Laird	Ch.	West Chester	Prof. Youngman's
Bennett Moorhead Livezey	Ch.	Doylestown	Φ Κ Ψ
Jacob Livingston	B.S.	Dover, N. J	84 N.
Solomon Livingston	B.S.	Dover, N. J	84 N.
Richard Bennett Lloyd	C.E.	Washington, D. C	Χ Φ
Richard Whitney Logan	M.E.	Scranton	Φ Κ Ψ
Robert Lee Logan	A.B.	Philadelphia	37 S.
John Frederick Luhr	M.E.	Roselle Park, N. J	Δ Κ Ε
Lawrence Thomas McCormick	C.E.	Belmar, N. J	129 M.
Francis Andrew March	C.E.	Harrisburg	Δ Κ Ε
William Leo Matthes	M.E.	Phillipsburg, N. J.,	Home, 99 Sitgreaves
Kenneth Alston Maxwell	Ph.B.	Meadowbrook, N. Y	Δ Υ
John Preston Mayfield	B.S.	Washington, D. C	Χ Φ
Norman William Miller	Ch.	Washington, D. C	Χ Φ
Gerald Amos Morgan	C.E.	Harrisburg	Φ Δ Θ
Leon Newpher Morgan	C.E.	Harrisburg	Φ Δ Θ
Harold Mumma	E.E.	Steelton	Φ Δ Θ
Frank Maurice Murphy	Ph.B.	Greensburg	34 S.
Milton Kendall Myers	Ch.	Washington, D. C	130 M.
Harry Campbell Neely	A.B.	Woodbine	Θ Δ Χ
James Hance Neighbour, Jr	C.E.	Dover, N. J	Φ Κ Ψ
Harold Herman Offutt	Ch.	Washington, D. C	136 McC.
John Secrist Oller	Ph.B.	Waynesboro	113 McK.
Norman Kethlege Pearson	C.E.	Bangor	136 McC.
Daniel James Perry	E.E.	Easton	137 So. 13th
Edward Arthur Pitcher	C.E.	Dover, N. J	Φ Κ Ψ
Willard Averell Pollard, Jr	C.E.	Washington, D. C	147 P.
Thomas Bancroft Reifsnyder	A.B.	Rhinebeck, N. Y	50 S.
William Franklin Remaly	C.E.	Easton	409 High
Chauncey Hoffman Ribble	E.E.	Washington, N. J	Φ Γ Δ
George James Richards	C.E.	Wilkes-Barre	37 S.
Ross Wadsworth Rohn	Ph.B.	Shiloh, N. J	169 E.
Herbert Knapp Rollins	E.M.	Staunton, Va	Δ Τ Δ
Frank Huff Schlough	E.E.	Easton	109 Orchard

NAME.	COURSE.	RESIDENCE.	ROOM.
Fred Calvin Shotwell	Ph.B.	Phillipsburg, N. J.,	Gramana Farm
Monroe Wilson Sloyer	Ph.B.	Tatamy	Tatamy
Earl Russell Smith	E.E.	Easton	1074 Berwick
Henry Jacob Smith	Ph.B.	New Oxford	Σ N
Lewis Aaron Smith	A.B.	Easton	R. D. No. 2
Harold Van Allen Stewart	Ch.	Quakake	203 McC.
Samuel Biffert Stilwell	Ph.B.	Doylestown	62 B
John Norwood Stipe	Ph.B.	Easton	13th and Bushkill
Leon Stansfield Stone	Ph.B.	Devon, Conn	Brd.
Russell Bennett Stone	Ph.B.	Easton	476 Nesquehoning
Guy Holden Stoutenburgh	B.S.	Newark, N. J	Φ K Ψ
Charles Xavier Thomas	B.S.	Freeland	609 High
Henry Huston Thomas	Ph.B.	Franklin	Σ X
Oscar Saul Tischler	Ph.B.	Wilkes-Barre	16 S.
Henry Moffett Tonkin	E.M.	Millington, Md	83 N.
James Lilly Trowbridge	A.B.	Easton	402 Cattell
George Brinton McClellan Troxell	Ch.	Easton	185 Charles
Richard Britton Unangst	Ch.	Wilkes-Barre	230 McC.
Charles Reinhart Wackenhuth	Ph.B.	Picture Rocks	152 P.
Frank Frederick Weaver	Ch.	Easton	18th and Butler
Edward Welles, Jr	B.S.	Wilkes-Barre	28 S.
Charles Stevenson Wheeler	Ph.B.	Newville	62 B.
Thomas Arthur Williams	A.B.	Fullerton	133 M.
Joseph Gilliard Williamson	Ch.	Bloomsbury, N. J	Home
William Henry Wilson	C.E.	Perth Amboy, N. J	36 S.
Edwin Willard Woehling	C.E.	East Orange, N. J	65 B.
William Irwin Woodcock, Jr	Ph.B.	Hollidaysburg	Φ K Ψ
Clark Ellis Woodring	E.E.	Hazleton	1327 Washington
Archie Scott Woods	M.E.	Easton	Chestnut and Cattell
Harold John Woodward	E.E.	Cookstown, N. J	X Φ
Lewis Benjamin Wyckoff	C.E.	Asbury Park, N. J.,	136 McC.
Russell Holcombe Wyckoff	C.E.	Flemington, N. J	Δ T Δ
James Simpson Young	A.B.	Wood Ridge, N. J.	100 McK.

SENIORS........123

JUNIOR CLASS, 1917.

NAME.	COURSE.	RESIDENCE.	ROOM.
Walter Decoursey Addis	B.S.	Oak Lane	Φ Δ Θ
David Bowman Adler	Ph.B.	Yonkers, N. Y	152 P.
Jay Warren Angle, Jr	Ph.B.	Hot Springs, Ark	Δ Υ
Irving LaFétra Arbeely	A.B.	Vienna, Va. R. F. D.	144 P.
Robert Earle Bacon	Ph.B.	Bridgeton, N. J	Δ Υ
Edwin Rockerfeller Baldrige	E.E.	Hollidaysburg	Ζ Ψ
Irenaeus Prime Bartley	M.E.	Bartley, N. J	Ζ Ψ
William Clair Behney	Ph.B.	Lebanon	Φ Δ Θ
William Stanley Bell	C.E.	Cranford, N. J	Σ Ν
Frederick William Biltz	C.E.	Ashland	82 N.
Kenneth Merry Bixler	Ph.B.	Easton	206 Spring Garden
Roger Hunt Blake	A.B.	Trenton, N. J	98 McK.
Frederick Leo Brannon	Ph.B.	Hazleton	51 S.
Roland Wilbur Brown	B.S.	Aquashicola	161 E.
Charles Clare Brownmiller	Ph.B.	Shoemakersville	80 N.
Wilson Earl Caffey	C.E.	Phillipsburg, N. J., Home,	212 Mercer
John Kay Christmas	M.E.	Easton	Sullivan St.
Heston Rarick Cole	C.E.	Succasunna, N. J.,	908 Paxinosa
Earle Johnston Conover	Ph.B.	South River, N. J	35 S.
Harold Alanson Crane	Ph.B.	Phillipsburg, N. J., Home,	101 So. Main
Ralph Worthington Crane	Ph.B.	South Amboy, N. J.,	69 B.
Benjamin George Dann	C.E.	Beltsville, Md	Δ Τ Δ
Pardee Fullerton Day	Ph.B.	Hazleton	Θ Δ Χ
Louis Leon deSalignac	C.E.	Pompton Lakes, N. J	82 N.
John Patrick Diamond	C.E.	Cynwyd	Δ Υ
Paul Elliott Dodson	Ph.B.	Wilkes-Barre	142 P.
Robert Leslie Dunlap	E.E.	Easton	1032 Lehigh
Joseph Raymond Evans	Ph.B.	Washington, N. J	Home
Joshua Grover Everard	Ph.B.	Wapwallopen	Δ Τ Δ
Edwin Grone Eyerly 2nd	Ph.B.	Danville	Σ Ν

Name.	Course.	Residence.	Room.
William Voorhees Garretson	Ch.	Perth Amboy, N. J.,	1101 Lehigh
Fred Lewis Gerard	C.E.	Hampton, N. J	Σ X
William Elwood Gilbert	Ch.	Spring City	65 B.
Leo Alton Aloysius Gordown	Ph.B.	Phillipsburg, N. J., Home,	7 Heckman
Harold Crane Griffin	E.E.	Phillipsburg, N. J., Home,	159 Chambers
Joachim Isaac Gulick	A.B.	Whitehouse Sta., N. J.,	232 McC.
Fred Passmore Gutelius, Jr.	C.E.	Moncton, N. B., Canada,	Φ K Ψ
Judah Louis Hahn	A.B.	Easton	———
Frank Sharp Hammond	M.E.	Coatesville	Φ Γ Δ
William Alfred Handwerk	Ch.	Northampton	163 E.
Harry Cyphers Hartung	E.E.	Phillipsburg, N. J., Home,	47 Washington
Herbert Hogg Harvey	A.B.	Newtown	———
John Kinsey Hefferman	A.B.	Easton	256 Bushkill
Robert Leon Hefferman	C.E.	Easton	256 Bushkill
George Mathews Henry	B.S.	Lebanon	Δ Υ
Raymond Walker Hill	A.B.	Metal	50 S.
Floyd Hoffman	B.S.	Califon, N. J	79 N.
Carl Edwin Houck	Ph.B.	Bangor	107 McK.
Samuel McCoy Hunt	E.E.	Sussex, N. J	Φ Δ Θ
Russell John Hurd	C.E.	Pen Argyl	36 S.
Charles Heebner Ives	A.B.	Scranton	113 McK.
George Denis Kane	Ph.B.	Phillipsburg, N. J., Home,	224 Chambers
Harold Raudenbush Keeler	Ph.B.	Harleysville	148 P.
George Wilbur Kidney	C.E.	Phillipsburg, N. J., Home,	377 So. Main
Arnold George August Klosé	A.B.	Great Meadows, N. J	51 S.
Howard Franklin Koons	C.E.	Perth Amboy, N. J.,	Heckman St., Phillipsburg

NAME.	COURSE.	RESIDENCE.	ROOM.
Israel Krohn	Ph.B.	Easton	698 Northampton
John Curry Lee	M.E.	Pottsville	Θ Δ Χ
Harper Ferguson Leeper	A.B.	Media	Δ Κ Ε
Frank Henry Lehecka	C.E.	Easton	110 Parker Ave.
Frederick Augustus Lehmann	E.E.	Washington, D. C.	81 N.
Claude Brinser Lerch	Ph.B.	Highspire	Δ Υ
Daniel Charles Lichtenwalner	Ch.	Tatamy	Home
Charles Edgar Lothrop	Ph.B.	Easton	East Paxinosa Ave.
Clarence Willard Lowden	Ph.B.	Delmar, Del	Σ Ν
David Lewis McAllister	M.E.	Newton, N. J	132 M.
Joseph Alexander McCurdy, Jr.	A.B.	Greensburg, R. F. D. 2,	48 S.
Maxwell McKeen	Ph.B.	Easton	310 New
Harry Alexander MacFadden, Jr	E.E.	Hollidaysburg	Ζ Ψ
Carl Theodore Mack		Easton	418 McC.
Francis Andrew March, III	Ch.	Easton	Prof. March's
Henry Dusenbery Maxwell, Jr.	M.E.	Easton	208 Spring Garden
Harry Smuller Meily, Jr	Ph.B.	Tyrone	Φ Δ Θ
Howard George Memory	M.E.	Maplewood, N. J	Δ Τ Δ
Fred Biesecker Merring	A.B.	East Stroudsburg	113 McK.
Ford Andrew Miller	Ph.B.	Easton	924 Butler
Redington Moore	M.E.	Laconia, N. H	305 New
Donald Adam Mummert	A.B.	Harrisburg	Brd
Daniel Hawkins Overton, Jr	A.B.	Islip, N. Y	48 S.
Charles Marvin Pardee	B.S.	Hazleton	Θ Δ Χ
Carl George Paulson	Ph.B.	Greensburg	Φ Δ Θ
George Edwin Pidcock	C.E.	Bloomsbury, N. J	Home
Joseph Bradley Quig	Ch.	Delaware, N. J	69 B.
James Herbert Quiri	C.E.	Easton	115 McC.
Harold Henry Rahn	C.E.	Kutztown	47 S.
Harry Lawrence Ramage	C.E.	Warwick, N. Y	175 E.
John Coffey Reese	Ph.B.	Shippensburg	114 McK.
Harry Victor Reiner	M.E.	Newark, N. J	Ζ Ψ
Cecil Blair Rodgers	Ph.B.	Sugar Run	119 McK.
Bernard Rosenthal	B.S.	Wilkes-Barre	73 K.

NAME.	COURSE.	RESIDENCE.	ROOM.
Daniel LeRoy Ross	C.E.	Easton	1214 Spruce
Herman Bertram Sheporwich	Ph.B.	Wilkes-Barre	522 New
Warren Kretchting Sherman	A.B.	New Germantown, N. J.,	Prof. Youngman's
George Sellers Smith	M.E.	Latrobe	Φ K Ψ
Philip Charles Smith, Jr	C.E.	Easton	Sullivan
Sydney Griswold Smith	C.E.	Phillipsburg, N. J., Home,	97 So. Main
Earle Spader Snyder	B.S.	Atlantic Highlands, N. J.,	Δ T Δ
Arthur Raymond Bunting Stern	C.E.	Philadelphia	167 E.
Grayson Mentzer Stickell	Ph.B.	Waynesboro	Φ Δ Θ
Mortimer Menville Stocker	C.	Honesdale	35 S.
Paul Herbert Taylor	E.E.	Camden, N. J	Δ Υ
Frank Fisher Truscott	Ph.B.	East Stroudsburg	Δ T Δ
Allen Scott Turner, Jr	E.E.	Maplewood, N. J	Δ K E
Forrest Cecil Read Van Horn	Ph.B.	Hope's	Harmony, N. J.
Arthur Richard Walk	Ph.B.	Chambersburg	Φ Δ Θ
George Charles Watson	A.B.	Roda, Va	81 N.
William Francis Wefer	A.B.	Brooklyn, N. Y	153 E.
Henry Stanley Greiss Welty	A.B.	Portland	Σ N
Stewart Means Wikel	E.E.	Marietta	43 S.
Alun Sylvanis Williams	Ph.B.	Wilkes-Barre	Σ X
Benjamin Crispin Williams	Ph.B.	Berwick	100 McK.
Jacob Benjamin Woehrle, Jr.	A.B.	Wilkes-Barre	1323 Liberty
Norman Howard Wolbach	E.M	Easton	37 S. 13th
Emil Robert Zenke	M.E.	Scranton	X Φ
William Edward Zinn	Ch.	Easton	221 No. 10th

JUNIORS..115

SOPHOMORE CLASS, 1918

Eugene Henry Albright	C.E.	Mifflinburg	85 N.
Lewis Bower Allen	A.B.	Wilmington, Del	Δ K E
Gilbert Jamieson Banks	Ph.B.	Chambersburg	Φ Δ Θ
Norman Mitchell Bannerman	Ph.B.	Titusville, N. J	41 S.

NAME.	COURSE.	RESIDENCE.	ROOM.
Elvin Leon Barr	Ch.	Easton	1032 Berwick
Aaron Seibert Bauer	A.B.	Wilkes-Barre	146 P.
Richard Bennett Bechtel	C.E.	Trenton, N. J	41 S.
Guy Arthur Bensinger	A.B.	Ashland, Pa.	147 P.
Arthur Blasi	Ph.B.	Newark, N. J.,	647 Northampton
Charles Francis Bowman	C.E.	Pittsburgh	———
Bertine James Boyer	Ph.B.	Brodheadsville	47 S.
Lester Hill Britton	E.E.	Copper Hill, N. J	637 High
Thomas Franklin Burley, Jr.	Ph.B.	Belvidere, N. J	232 Cattell
Wayne Notley Clugston	Ph.B.	Waynesboro	105 McK.
Berthold Frank Conde	C.E.	High Bridge, N. J.,	1440 Washington
Paul Grandin Condit	Ph.B.	Newton, N. J	90 N.
Edwin Roscoe Conklin	Ph.B.	Lakewood, N. J	87 N.
Frank Edward Coughlin	B.S.	Luzerne	Δ Τ Δ
William Leo Courson	Ph.B.	Picture Rocks	127 M.
Mortimer Park Crane	Ph.B.	Germantown	———
Willard deCamp Crater	Ch.	Succasunna, N. J	635 High
Mumford Chamberlain Crossley	M.E.	Binghamton, N. Y	Φ Κ Ψ
Everett Kelsey Davey	M.E.	Rockaway, N. J	Δ Υ
Edgar Kirk Dawson	Ph.B.	West Cape May, N. J.,	129 M.
Jose Maria Diaz, Jr	B.S.	Hackensack, N. J	Φ Κ Ψ
Charles Alvan Dimm	B.S.	Mifflinburg	Φ Δ Θ
John Edward Doheny	C.E.	Haverford	Δ Υ
Lewis Patrick Dolan	B.S.	Ogdenburg, N. J	Φ Δ Θ
Andrew Kenneth Dougall	B.S.	Maplewood, N. J	Δ Κ Ε
Samuel Douthert, Jr	M.E.	Newark, N. J	212 McC.
George Henry Drake	Ch.	Newark, N. J	98 McK.
John Kilshaw Dunn	B.S.	New York, N. Y	Ζ Ψ
William McClure Dyer	M.E.	Trenton, N. J	Φ Δ Θ
Arthur Serfass Eichlin	Ch.	Easton	1627 Northampton
William Leone Eldredge	B.S.	West Cape May, N. J.,	122 McK.

Name.	Course.	Residence	Room.
Robert Arthur Farnam	B.S.	LaCrosse, Wis	Δ K E
Joseph Fitts	Ch.	Washington, N. J	Σ X
George Wyckoff Fleming	Ph.B.	Washington, N. J	Home
Leeth Ivan Florey	A.B.	Pen Argyl	170 E.
Edwin Arnold Forrest	Ph.B.	Spring City	Σ N
Harry Joshua Frey	Ph.B.	Rochester, N. Y	Z Ψ
Frank Royal Gammon	B.S.	Boston, Mass	Δ K E
Homer Edward Graham	B.S.	Ashley	Φ K Ψ
Paul Staley Grant	A.B.	Oak Park, Ill	131 M.
John Fulton Grimm	Ph.B.	Newville	Φ K Ψ
Joseph Guzzetto	Ph.B.	Easton	123 South Third
Elbert Wilson Haldeman	Ph.B.	Danboro	85 N.
Paul McCollum Hallam	E.M.	Washington, Pa	115 McC.
Robert Forster Hare	Ph.B.	Altoona	Φ K Ψ
Jonathan Moore Harris	B.S.	Easton	723 Paxinosa
Hamilton Ritchie Hill	Ph.B.	Westbury, N. Y	Z Ψ
Harold Brekford Hofford	Ch.	Bloomington, Ill	Φ Γ Δ
Rosser Almer Huff	B.S.	Bethlehem	X Φ
Frank Marion Hunter	Ph.B.	Spring City, Pa	107 McK.
Alvan Smith Hutchinson	C.E.	Oyster Bay, N. Y	Φ Δ Θ
Samuel Kenneth Hutchinson	A.B.	Stroudsburg	45 S.
John Benson Irvin, Jr	B.S.	Williamsport	X Φ
Charles Justus Itter, Jr	C.E.	Hazleton	23 S.
Albert Thomas Jones	Ch.	Scranton	72 B.
Frank Smith Jones	C.E.	Delaware, N. J	Δ Υ
George Valentine Massey Jones*	C.E.	Dover, Del	X Φ
John Wright Kanehann	A.B.	Phillipsburg, N. J.,	Home, Delaware Park
Roy Buchanan Karn	Ch.	High Bridge, N. J	Home
John Spencer Kelly	B.S.	Troy, N. Y	11 S.
Carleton Bannister Kidney	C.E.	Phillipsburg, N. J.,	Home, 377 So. Main
Alvan Ray Kirschner	Ph.B.	Hazleton	23 S.
John Clayton Kistler	P.M.	Lansford	X Φ

* Died November 21, 1915.

NAME.	COURSE.	RESIDENCE.	ROOM.
Frank Joseph Klein	B.S.	Easton	204 St. Joseph
Walter Gehret Kleinspehn	Ch.	Reading	159 E.
Edgar Laubach Kline	M.E.	Martin's Creek	Home
Albert Seeger Kohl	Ph.B.	Newburgh, N. Y.	Θ Δ Χ
Ernest Evans Kohl	A.B.	Maryd	168 E.
Kenneth Farrington Kressler	A.B.	Easton	205 Madison
William Egbert Kressler	B.S.	Easton	205 Madsion
Joseph Earl Lenhart	Ph.B.	Colmar	133 M.
Leon Elias Lewis	A.B.	Mahanoy City	Φ Γ Δ
Clarence Smaling Line	Ch.	Westtown, N. Y.	635 High
Irving Otto Lippman	Ph.B.	Newark, N. J.	230 McC.
William Lash Lipps	E.E.	Mt. Vernon, N. Y.	611 High
Abram Lipson	Ch.	Newark, N. J.	29 S.
James Russell Longstreet	M.E.	Manasquan, N. J.	108 McK.
Theodore van Kleeck Lyman	B.S.	Chefoo, China	Φ Κ Ψ
Donald McBride	B.S.	Brooklyn, N. Y.	Δ Κ Ε
Henry Evan McElfresh	C.E.	Washington, D. C.	———
Albert Wesley McKenney, Jr.	B.S.	Greensburg	Χ Φ
Charles Andrew Maloney	M.E.	Philadelphia	Δ Υ
Martin Marasco	Ch.	Easton	Prof. Hart's
Wallace Carlin Maxfield	B.S.	Bloomfield, N. J.	Δ Κ Ε
John High Mecray	B.S.	Cape May, N. J.	128 M.
Charles Samuel Messinger	A.B.	Easton	253 Bushkill
Marshall Rinker Metzgar	Ph.B.	Stroudsburg	45 S.
Hugh Stewart Millar	A.B.	Tamaqua	171 E.
Donald Fischer Miller	M.E.	South Orange, N. J.	Δ Κ Ε
Walter McKinley Miller	Ph.B.	Hazleton	40 S.
Frank Dewey Munro	A.B.	Hazleton	40 S.
Harry Randolph Hull Nicholas, Jr.	B.S.	Flanders, N. J.	Θ Δ Χ
Robert Bertram Overton	P.M.	Patchogue, N. Y.	Ζ Ψ
Charles Gerald Palmer	C.E.	Pen Argyl	172 E.
Owen Curtis Pearce	Ph.B.	Manasquan, N. J.	139 F.
Harold Edgar Peifer	C.E.	Easton	200 No. Tenth

Name.	Course.	Residence.	Room.
David Oscar Emanuel Peterson	Ch.	Perth Amboy, N. J.	49 S.
John Heber Phillips	C.E.	Steelton	635 High
Peter Duglass Pittenger	Ph.B.	Easton	R. D. No. 3
Porter Grier Polk	B.S.	Danville	Z Ψ
James Madison Porter, Jr., IV	B.S.	Easton	53 No. Third
James Lewis Prescott	B.S.	Passaic, N. J	128 M.
Earl E. Purcell	A.B.	Pen Argyl	172 E.
Wellden Pyle	P.M.	Jersey City, N. J	X Φ
Edward Christopher Rafferty, Jr	E.E.	Easton	1015 Butler
Douglass Odenwelder Reed	C.E.	Easton	730 Bushkill
Orion Hughes Reeves	Ph.B.	West Cape May, N. J.,	122 McK.
Fred Elliott Renn	Ch.	Shamokin	38 S.
John James Reynolds, Jr	B.S.	Phillipsburg, N. J.,	Home, 413 So. Main
Stewart Shirley Reynolds	Ph.B.	Washington, D. C	Z Ψ
Howard Kenneth Riegel	E.E.	Easton	56 So. Front
Jacob Henry Ritter	E.E.	Weatherly	41 S.
William Wallace Robertson	C.E.	Washington, D. C	Δ T Δ
Louis Nicholas Rocca	A.B.	Easton	322 High
Nicholas Ralph Rothermel, Jr	B.S.	Bernharts	80 N.
Paul Elwood Sandt	C.E.	Easton	506 McC.
Millard Russell Sarson	Ch.	Washington, N. J.,	Kroner Place, P'burg, N. J.
Thomas Samuel Searles	C.E.	Wilmington, Del.	609 High
Hoyle Gilman Seeley	Ch.	Scranton	139 F.
Monroe Holmes Shoemaker	M.E.	Elmira, N. Y	Θ Δ X
Charles Theodore Siebert, Jr	M.E.	Pittsburgh	X Φ
Douglass Lee Smith	C.E.	Kingston	711 High
Kenneth Milton Smith	B.S.	Latrobe	Φ K Ψ
Rayburn F. Smith	C.E.	Mansfield	637 High
Robert Bitner Smith	E.E.	Connellsville	136 McC.
Walter Thomas Spry	Ch.	Plymouth	110 McK

NAME.	COURSE.	RESIDENCE.	ROOM.
Edwin Smyser Strawbridge	Ph.B.	York	Z Ψ
Hugh Oscar Tompkins	Ph.B.	Ocean Grove, N. J	Φ Δ Θ
Nathaniel Taylor Trembath	Ph.B.	Kingston	Φ Γ Δ
John Henderson Trubee	A.B.	Derby, N. Y	Φ K Ψ
William Berner Ulmer	B.S.	Pottsville	Θ Δ X
Frederick William Vigelius	M.E.	Easton	342 Cattell
John Brennen Edward Vilsack	B.S.	Pittsburgh	Θ Δ X
Laurens Washington Wallazz	E.E.	Easton	130 McC.
George Russell Waltman	Ch.	Easton	513 Center
Warren Loudenburg Wambold	Ch.	Phillipsburg, N. J	——
Albert Mathis Weber	C.E.	Washington, D. C.	116 McK.
John Ambrose Weldon	Ph.B.	Watertown, N. Y	Z Ψ
J. Ludlow White	C.E.	Easton	105 Monroe
Thomas Willever	B.S.	Phillipsburg, N. J., Home,	1083 S. Main
William Sampson Williams	E.E.	Minersville	116 McK.
Howard Sidney Willson	Ch.	Andover, N. J	131 McC.
Harry Ellsworth Winters	Ph.B.	Holtwood	131 M.
Carl Robert Wolbach	C.E.	Easton	37 So. 13th
William Moodie Woodruff	E.E.	Trenton Junction, N. J.,	151 P.
Harold Leslie Woods	M.E.	Easton	Chestnut and Cattell
David John Zehner	C.E.	Easton	330 No. Seventh
Russell Zimmerman	M.E.	Kingston	——

SOPHOMORES..152

FRESHMAN CLASS, 1919

NAME.	COURSE.	RESIDENCE.	ROOM.
Noel Constant Albertson	Ph.B.	Bridgeton, N. J	117 McK.
Algert Daniel Alexis	C.E.	Minersville	108 McK.
Charles Spencer Allen	E.E.	Easton	909 Northampton
William Hunter Anderson	B.S.	Pittsburgh	Θ Δ X
Sellers Hoffman Barnett	B.S.	Mt. Alverno	Φ Γ Δ
William Barnett, 3d	B.S.	Mt. Alverno	Φ Γ Δ
Harry Welling Barrick	C.E.	Trenton	609 High
Harman Edward Baugh	C.E.	Mt. Holly, N. J	611 High

Name.	Course.	Residence.	Room.
William Raymond Baur	B.S.	Wilkes-Barre	73 K.
Herbert Campbell Beatty	Ph.B.	Hoboken, N. J.	Δ Υ
Donald Allen Behney	Ph.B.	Lebanon	Φ Δ Θ
George Hornbeck Bell	B.S.	Port Jervis	117 McK.
Roy Bellis	C.E.	Flemington, N. J.	605 High
Thaddeus Andrew Biddle	B.S.	Altoona	Φ Κ Ψ
Archie R. Bigony	B.S.	Reading	136 F.
Andrew Hunlock Billings	B.S.	Forty-Fort	Ζ Ψ
William Arthur Bissell	Ph.B.	Dalton, Pa	Φ Γ Δ
Jesse Wellington Booth	C.E.	Middletown, N. Y.	109 McK.
Alson Brandes	A.B.	Newark	29 S.
Donald Broadbent	P.M.	Easton	686 Lehigh
Ira Tripp Broadbent	Ch.	Scranton	Ζ Ψ
Walter Middleton Brown	B.S.	Lakewood, N. J	134 M.
Alexander McWhorter Bruen	Ch.	Belvidere	Belvidere
Adolph Albert Buechner	A.B.	Ozone Park, N. Y.	155 E.
George Henry Burroughs	B.S.	Manasquan, N. J	Θ Δ Χ
Carver Ingham Camp	Ph.B.	Tunkhannock	86 N.
Francis Charles Caracciolo	Ph.B.	Mayfield	95 McK.
Robert P. Carr	Ch.	East Orange, N. J.	10 S.
Walter Frederick Christmas	C.E.	Easton	Sullivan St.
Everett Wallace Clough	Ph.B.	Middleboro, Mass	Δ Κ Ε
Simon Cohen	C.E.	Washington, N. J	———
Elston Cortright Cole	Ph.B.	Stroudsburg	45 S.
John Stephen Cole	Ch.	Easton	———
George Bryan Cook	E.E.	Manasquan, N. J	150 P.
Arthur Alexander Cope	A.B.	Hamburg	66 B.
Alonzo Fisher Corby, Jr	Ph.B.	Nesquehoning	121 McK.
Ellsworth Hiester Croll	A.B.	Easton	1217 Spruce
Winthrop Parker Culver	E.M.	Montclair, N. J	Δ Υ
Harold Joseph Curry	M.E.	Easton	367 Berwick
Samuel Augustus Curtiss	C.E.	Norfolk, Conn	61 B.
George Allen Davis	B.S.	Scranton	77 K.
William Thomas Davis, Jr	Ph.B.	Summit Hill	———
James Charles Dennen	Ph.B.	Princeton, N. J	———

Name.	Course.	Residence.	Room.
Herman Otto Dietz	P.M.	Washington, D. C.	162 E.
Alva Charles Dinkey	Ch.	Pittsburgh	Θ Δ Χ
Edward Siebert Disbrow	E.E.	Manasquan, N. J.	Σ Ν
James Ledward Dobson	C.E.	Philadelphia	Δ Τ Δ
Isaac Hager Dorland	Ch.	High Bridge, N. J.	Home
Paul Frederick Drake	Ch.	Phillipsburg	85 Summit Ave.
Wilbur Charles Drugan	Ch.	Trenton, N. J.	———
William James Duncan	B.S.	Matawan, N. J.	Δ Κ Ε
Ralph Keck Durstein	E.E.	Wilmington, Del.	94 McK.
Leslie Fremont Ellis	B.S.	Maplewood, N. J.	411 High
Samuel Moffitt Ellis	C.E.	Philadelphia	Φ Γ Δ
Robert G. Ernst	C.E.	Hoboken, N. J.	Δ Υ
Gerard Magella Fahey	A.B.	Scranton	Φ Γ Δ
James Fairclough	E.E.	Paterson, N. J.	70 B.
Charles M. Fehr	Ch.	Easton	746 Milton A.
Ferdinand Milton Ferguson	P.M.	New York, N. Y.	Δ Υ
Harry Atherton Fillmore, Jr.	B.S.	Shickshinny	Δ Κ Ε
John Lawrence Fitzgerald	C.E.	Passaic, N. J.	24 S.
William Porter Fitz-Randolph	Ch.	Easton	937 Lehigh
William Arthur Frack	Ph.B.	Nazareth	Home
William Henry Galbreath, Jr.	A.B.	Delta	156 E.
Louis Anthony Gardier	Ch.	Scranton	110 McK.
Philip Reading Gebhardt	B.S.	Clinton, N. J.	14 S.
Frederick Ernst Gerlock	M.E.	Scranton	118 McK.
Robert J. O. Gicking	B.S.	Hazleton	121 McK.
Russell Lynn Godshalk	E.E.	Easton	710 Brodhead
Carleton K. Gradwohl	Ch.	Easton	206 McC.
Edward Dean Griffith	A.B.	Plymouth	Φ Γ Δ
Herman Grollman	Ch.	Easton	105 N. 7th
George Bartlett Grooby	Ch.	Phillipsburg, N. J.	39 Chambers
Walter Alexander Groves	A.B.	Germantown	156 E.
William Frank Guntner	C.E.	Philadelphia	138 F.
Leon William Hackett	Ph.B.	High Bridge, N. J.	14 S.
Ralph William Hackett	Ch.	Trenton, N. J.	Δ Τ Δ

Name.	Course.	Residence.	Room.
Milton Otto Hager	C.E.	Buffalo, N. Y	627 High
Joseph Norman Heil	C.E.	Easton	106 Cattell
Hobart Daniel Heisler	A.B.	Orwigsburg	158 E.
Benjamin Darby Higgins	E.E.	Manasquan, N. J.,	103 N. 4th
William Orme Hiltabidle, Jr.	C.E.	Washington	43 S.
Robert Watson Hodgson	Ch.	Scranton	77 K.
Charles Clayton Hollenbach	Ch.	Reading	88 N.
Arthur Fox Holler	B.S.	Hummelstown	137 F.
Orion Cornelius Hopper	A.B.	Woodhaven, N. Y.	136 McC.
Clinton John Hopf	B.S.	Elizabeth	173 E.
Charles Summer Horton	B.S.	Williamsport	———
Robert Louis Houck	P.M.	Easton	27 S. 9th
William Murray Houser	B.S.	Altoona	130 McC.
Sylvester VanSlyke Howell	B.S.	Clinton, N. J	14 S.
Henry Clay Hunt	M.E.	Sussex, N. J	Φ Δ Θ
Louis Frederick Huttenlocher	Ph.B.	Patchogue, N. Y	154 E.
Joseph Henry Jackson	Ph.B.	New York, N. Y.	637 High
George Parbury Pollen Jewett	B.S.	Nyack, N. Y	Χ Φ
Richard Thomas Jones, Jr.	A.B.	Philadelphia	115 McK.
John Clement Justin	A.B.	West New York, N. J.	150 P.
Alan M. Kaufman	Ph.B.	Washington, D. C.	24 S.
Paul Darlington Kern	C.E.	Easton	756 Washington
Leroy Rutherford Klein	C.E.	Rutherford, N. J.	605 High
John Harold Kottman	M.E.	Maplewood, N. J.	132 M.
Kenneth Stewart Kuhn	P.M.	Easton	326 N. 9th
Austen Randolph Lake	B.S.	Buffalo	Δ Κ Ε
James Milton Lawson	B.S.	Trenton, N. J.	Φ Γ Δ
Henry Stanley Lehr	C.E.	Easton	1144 Butler
John Matthew Lemmen	E.E.	Easton	1202 Chidsey
De Forest Motter Lescure	A.B.	Harrisburg	135 F.
Robert Hamilton Lewis	Ch.	Scranton	118 McK.
George Henry Lowe	B.S.	Arlington, Mass.	Δ Κ Ε
Benjamin Chidlaw McCabe	B.S.	Duluth, Minn.	78 K.
Jesse Ezra McFall	A.B.	Flicksville	162 E.
William McKinney McKelvy	B.S.	Pittsburg	Θ Δ Χ

Name.	Course.	Residence.	Room.
William Francis McNally	B.S.	Easton	111 N. 2d
Charles McVeigh	Ph.B.	Easton	19 S. 12th
James G. Mitchell MacCartney	A.B.	Altoona	76 K.
Alexander MacDonald	B.S.	Brooklyn, N. Y.	———
George Kemerer MacFetridge	A.B.	Allentown	148 P.
Charles Stewart MacNeal	A.B.	Hazleton	231 Cattell
Donald VanMater Magee	E.E.	Easton	608 Meixsell
Peyton Conway March, Jr	C.E.	Washington, D. C.	Prof. March
Frank Fred Martin	M.E.	Easton	665 Spring Garden
Merle Creston Miley	A.B.	Chambersburg	78 K.
Charles Donley Miller	C.E.	Scottdale	Θ Δ Χ
Joseph Edward Mitinger	A.B.	Greensburg	143 P.
Aston Hugh Morgan, Jr	B.S.	Wilkes-Barre	Δ Τ Δ
William Leo Morrison	B.S.	Altoona	Φ Κ Ψ
Roy Stanley Murphy	E.E.	Phillipsburg, N. J.	29 Glen Ave.
Julius Naab	E.E.	Easton	128 Kleinhans A.
Willard Odenwelder	B.S.	Easton	45 S. 4th
Gwilym Emyr Owen	Ph.B.	Scranton	44 S.
Sutherland Palmer	Ch.	St. George, N. Y.	Θ Δ Χ
Russell Winthrop Park	Ch.	Easton	114 N. 3d
John Leslie Parker	Ph.B.	Paterson, N. J.	33 S.
Frank Ellsworth Parkhurst, Jr	B.S.	Wilkes-Barre	Δ Υ
James Allyn Pentz	B.S.	Philadelphia	Δ Κ Ε
William C. Phelps	C.E.	East Orange	10 S.
Ralph Carleton Powell	M.E.	Philadelphia	———
Charles Edward Prescott	B.S.	Passaic	130 M.
George Thomas Price, Jr	C.E.	Pittsburgh	711 High
George Flemming Pursel	Ch.	Easton	303 Bushkill
John Hagerty Pursel	Ph.B.	Phillipsburg, N. J.	Fairview Hts.
Fred Burton Pursell	Ch.	Easton	1217 Washington
Harold Sankey Pyle	B.S.	New Castle	129 McC.

Name.	Course.	Residence.	Room.
Courtenay Lawrence Quick	E.M.	Dingman's Ferry	87 N.
Joseph Edward Raub	Ch.	Phillipsburg, N. J.	32 Belvidere A.
Archibald Coveter Rayner	B.S.	Washington, D. C.	———
Paul Frederick Regenfuse	Ch.	Reading	164 E.
Dill Biownell Register	A.B.	Bismark, N. D	X Φ
Henry George Frederick Richter	E.E.	Easton	436 Northampton
David William Roberts	A.B.	Scranton	44 S.
John McPherson Robertson	B.S.	Shippensburg	61 B.
William Edwin Rosenheim	B.S.	Passaic, N. J.	103 McK.
Frank Wilson Ross	E.E.	Easton	705 Coleman
George Willis Rundle	Ch.	Easton	43 N. 8th
Chauncey Taylor Rush	Ch.	Stratford, N. J	166 E.
Thomas Rutherford	Ph.B.	Easton	112 N. 11th
John Lesley Ryon	B.S.	Pottsville	Θ Δ X
Frederick Callen St. Clair	A.B.	Indiana	70 B.
James Raymond Sampson	A.B.	Philadelphia	102 McK.
William Lack Sampson	Ch.	Scranton	115 McK.
Ian Grant Scott	Ph.B.	Ambler	111 McK.
John Few Scott	M.E.	Pittsburgh	15 S.
John Sanders Scott	B.S.	Media, Pa	Δ K E
Willard Segraves	C.E.	Phillipsburg, N. J.	141 Washington
William Allis Serfass	Ph.B.	Easton	126 Reeder
Charles Bowlby Sharp	C.E.	Phillipsburg, N. J.	95 Summit A.
Edward Arthur Sherlock	P.M.	Auburn, N. Y	Δ T Δ
Grier Moore Shotwell	Ph.B	Indianapolis, Ind	137 F.
Lawrence L. Smith	B.S.	Belvidere	Home
Samuel Ringer Smith	C.E.	Easton	811 Ferry
Harold Collmar Snyder	B.S.	Jersey City, N. J.	Δ K E
William George Speed	B.S.	Baltimore, Md	———
David John Spratt	A.B.	Philadelphia	37 S.
Roy Fields Stanton	A.B.	Newburgh, N. Y	158 E.

NAME.	COURSE.	RESIDENCE.	ROOM.
Fred Henry Stegman	B.S.	South Orange, N. J.	Χ Φ
Mark G. Stern	Ch.	Reading	157 E.
Frank Edwin Stier	E.E.	Easton	154 S. 6th
Meriam Hollister Swan	M.E.	Passaic, N. J.	Ζ Ψ
Frank Benjamin Swartwont	E.E.	Huguenot, N. Y.	27 S.
Benjamin Willard Tague	Ph.B.	Scranton	75 K.
Fayette Newcomb Talley	Ph.B.	Port Morris, N. J.	——
William Wellington Taylor	Ph.B.	Scranton	75 K.
Henry Clark Thornton	B.S.	Indianapolis, Ind.	89 N.
John DeWitt Toll, Jr.	B.S.	Philadelphia	——
Gilbert Ewing Tomlinson	E.E.	Philadelphia	Δ Υ
George Lincoln Townsend	M.E.	Washington, D. C.	Θ Δ Χ
Lee Guard Treible	B.S.	Wilkes-Barre	Δ Τ Δ
Frank Curtis Trubee, Jr.	B.S.	Derby, N. Y.	76 K.
Howell Muirheid VanCleve	Ch.	Easton	119 Burke
Russell VanHorn	E.E.	Trenton, N. J.	609 High
Jay Calvin VanKirk	Ph.B.	West Newton	176 E.
Donald Glen Wait	B.S.	Watertown, N. Y.	——
Willard Warne	Ph.B.	Philadelphia	Σ Χ
George Charles Warner	Ph.B.	Weatherly	42 S.
Jesse Beadle Warren	B.S.	DuBois	136 F.
Harry Benson Watton	A.B.	Oak Lane	Δ Υ
Peter Dow Webster	A.B.	New Haven, Conn.	136 McC.
George Ernest Welde	B.S.	New York, N. Y.	88 N.
Franklin Seymur Weston	Ph.B.	Passaic, N. J.	89 N.
Fred McClullam Whitney	A.B.	Wellsboro	66 B.
Ernest Francis Williams	Ch.	Washington, D C.	27 S.
Forest Love Williams	B.S.	Portsmouth, O.	Φ Κ Ψ
John Ellsworth Williams, Jr.	M.E.	Portsmouth, O.	Φ Κ Ψ
William Everard Williams	E.E.	Washington, D. C.	Χ Φ
James Clinton Wolfe	P.M.	Bloomfield, N. J.	Δ Υ
Wesley Crook Wolfinger	E.E.	Easton	1410 Northampton
George Transue Woodring	Ph.B.	Easton	825 Lehigh
Harry Betz Wright	C.E.	Easton	184 Charles
Charles Edwin Young	Ph.B.	New Castle	129 McC.

NAME.	COURSE.	RESIDENCE.	ROOM.
Donald Ramsey Young	A.B.	Macungie	117 McC.
Thomas Cummings Zulick, Jr.	Ph.B.	Easton	New and Porter

FRESHMEN..212

SPECIAL STUDENTS

NAME	RESIDENCE.	ROOM.
Raymond Grant Kenyon	Easton	239 Northampton
Warren W. Klosterman	Ft. Washington, Pa.	79 N.
Grover C. Lesser	Upper Lehigh, Pa.	Home
Harold Wm. Anderson	Paterson, N. J.	92 McK.
Arthur Chester Camovits	Lakewood, N. J.	15 S.

CLASSIFICATION BY RESIDENCE (Non-graduates)

Arkansas	1	Minnesota	1	Wisconsin	1
Connecticut	3	New Hampshire	1		
Delaware	6	New Jersey	129		
Dist. of Columbia	21	New York	35	Canada	1
Illinois	2	North Dakota	1	China	1
Indiana	3	Ohio	2	South America	1
Maryland	3	Pennsylvania	390		
Massachusetts	3	Virginia	2		

ABBREVIATIONS FOR BUILDINGS AND COURSES OF STUDY

Brd.—Brainerd Hall.
B.—Blair Hall.
E.—East Hall.
F.—Fayerweather Hall.
K.—Knox Hall.
M.—Martien Hall.
McC.—McCartney St.
McK.—McKeen Hall.
N.—Newkirk Hall.
P.—Powell Hall.
S.—South College.

Δ K E—Fraternity House.
Σ X—Fraternity House.
Θ Δ X—Fraternity House.
Φ Δ Θ—Fraternity House.
Φ K Ψ—Fraternity House.
Z Ψ—Fraternity House.
X Φ—Fraternity House.
Δ Υ—Fraternity House.
Δ T Δ—Fraternity House.
Φ Γ Δ—Fraternity House.
Σ N—Fraternity House.

P.M.—Pre-medical.

———Absent at time of publication of catalogue.

SUMMARY

Courses.	Seniors.	Juniors.	Sophomores.	Freshmen.	Total.
Graduates	...	...	...	...	6
Specials	...	...	...	...	5
Bachelor of Arts	12	20	13	29	74
Bachelor of Philosophy	33	36	38	34	141
Bachelor of Science	14	7	31	52	104
Civil Engineering	23	22	25	27	97
Electrical Engineering	12	11	9	21	53
Mining Engineering	2	1	1	2	6
Mechanical Engineering	10	11	12	10	43
Pre-Medical	...	...	3	7	10
Chemical	17	7	20	29	73
Totals	123	115	152	211	612

BEQUESTS AND DEVISES

Each state has special statutory regulations in regard to wills, and it is most important that all testamentary papers be signed, witnessed, and executed in all other respects according to the laws of the state in which the testator resides. In all cases, however the name of the corporation must be accurately given, as in the following forms:

I give, devise, and bequeath to "Lafayette College," in Easton, Pennsylvania, its successors and assigns forever, the sum of ....dollars, to be invested by said corporation in good security, and the interest accruing therefrom to be applied to the support of the Professors in said College.

I give, devise, and bequeath a certain lot situated, etc., to "Lafayette College," in Easton, Pennsylvania, and to their successors and assigns forever, for the uses and purposes of said College, according to the provisions of its charter.

Charitable bequests are void in Pennsylvania unless made thirty days prior to the death of the testator.

INDEX

Absences from classes...... 102
Addresses of students...... 125
Administration
  Building................ 98
  Officers of.............. 13
Admission, Requirements for
  by certificate............ 16
  College Entrance Examination Board....... 17
  Examinations for......... 17
  Requirements in
    English............... 18
    French............... 22
    German............... 22
    Greek................. 21
    History............... 20
    Latin................. 21
    Mathematics.......... 21
    Physics............... 23
Alumni
  Associations............. 123
  Officers................. 123
  Trustees................ 6
Astronomy, Courses in..... 72
  Observatory............. 98
Athletics................. 114
Attendance............. 102
Bequest, Form of.......... 145
Bible, Courses in.......... 50
Biology, Courses in........ 63
  Laboratory............. 97
Botany, Courses in........ 63
Brainerd Hall........... 99
Buildings................ 96
Calendar for College Year. 4
Certificate, Admission by. 16
Chapel
  Memorial Building....... 100
  Attendance.............. 109
Chemistry, Courses in...... 64
  Laboratory.............. 97
Chemical Engineering
  Curriculum............32, 33, 36
Civil Engineering
  Courses................. 15
  Curriculum............32, 33, 37
Committees, Faculty....... 12
  Trustees................ 7
Courses of Instruction..... 50
  Tabular Exhibit of....... 29–41
Curriculum.............. 24
Degrees
  Conferred in 1915........ 115
  Requirements for B.A.... 24, 103
  Ph.B.................. 24 103
  B.S.................... 24, 103
  B.S. in Chem. Eng....... 24, 103
  in Civil Eng............ 24, 103
  in Elec. Eng............ 24, 103
  in Mech. Eng........... 24, 103
  in Min. Eng............ 24, 103
  B.S. in Chemistry........ 25, 103
  Requirements for M.A., M.S................. 104

- Dormitories, Rooms in.... 95
- Economics, Courses in...... 61
- Electrical Engineering
  - Courses.......... 82
  - Curriculum..........32, 33, 38
- English, Courses in........ 50
- Examinations
  - for admission.......... 17
  - Semi-annual.......... 103
  - for Master's Degree...... 104
- Expenses.......... 92
  - College Fees.......... 91
  - Board and Room......... 95
- Faculty, List of.......... 8
  - Committees.......... 12
- Fees.......... 91
- French, Courses in........ 58
- Freshman Class, List of... 138
  - Exhibit of Studies........ 29–35
- Gayley Hall.......... 97
- Geology, Courses in....... 68
- German, Courses in........ 59
- Government, Courses in.... 61
- Grades.......... 103
- Graduate Students
  - Candidates.......... 125
  - Requirements.......... 104
- Graduation
  - Requirements for......... 103
- Graphics, Courses in....... 69
- Greek, Courses in......... 52
- Groups of Studies......... 25
- Gymnasium.......... 98
- Historical Sketch of College.......... 14
- History, Courses in........ 61
- Honors.......... 105
  - awarded at Commencement, 1915.......... 118
- Hygiene, Course in........ 90
- Infirmary.......... 99
- Italian, Courses in........ 60
- Junior Class, List of...... 130
- Laboratory Fees......... 91
- Latin, Courses in.......... 57
- Library.......... 100
- Map..........Frontispiece
- March Field.......... 98
- Mathematics, Courses in... 71
- Mechanical Engineering. 85
  - Curriculum..........32, 33, 39
- Museum.......... 97
- Mining Engineering
  - Courses.......... 88
  - Curriculum..........32, 33, 40
- Observatory.......... 98
- Officers
  - of Administration........ 13
  - of Instruction.......... 8
  - Alumni.......... 123
- Pardee Hall.......... 96
- Pardee Scientific Dept... 13, 63
- Phi Beta Kappa.......... 112
- Philosophy, Courses in..... 62
- Physical Training........ 90
- Physiology, Courses in..... 63
- Physics, Courses in........ 73
  - Laboratory.......... 97
- Political Science......... 61

PREACHERS to the College.. 110
PRIZES.................... 105
PSYCHOLOGY, Courses in.... 62
PUBLIC LECTURES.......... 111
PUBLICATIONS............. 114
REGISTRATION............. 16
RELIGIOUS INSTRUCTION.... 109
ROOMS, College............ 95
SCHEDULES of Recitations.. 42–49
SCHOLARSHIPS............. 93
SENIOR CLASS, List of...... 125
SOCIETIES................. 112
SOPHOMORE CLASS, List of.. 133
SPANISH, Courses in........ 60
STUDENTS, by Classes....... 125
  Candidates for M.A...... 125
  Summary by Classes..... 145
  Summary by States...... 144
STUDIES, Tabular Exhibit of 29–41
SYNOD.................... 14
TERMS AND VACATIONS...... 104
TIME SCHEDULES........... 42–49
TRUSTEES, List of.......... 6
  Committees............. 7
TUITION.................. 91
VAN WICKLE LIBRARY...... 97
YOUNG MEN'S CHRISTIAN
  ASSOCIATION............. 112

VOL. XI, No. 2 DECEMBER, 1916

BULLETIN
OF
LAFAYETTE COLLEGE

GENERAL CATALOG
1916-1917

EASTON, PENNSYLVANIA

Published five times a year: In February, April, June, October and December, at Lafayette College, and entered as second-class matter, March, 1916, at Easton, Pennsylvania, under the Act of Congress, August 24, 1912.

CORRESPONDENCE

Correspondence addressed Lafayette College, Easton, Pennsylvania, may be expected to reach the proper department. To avoid delay, however, correspondents are requested to address letters as follows:

Requests for catalogs and inquiries regarding admission should be addressed to the REGISTRAR.

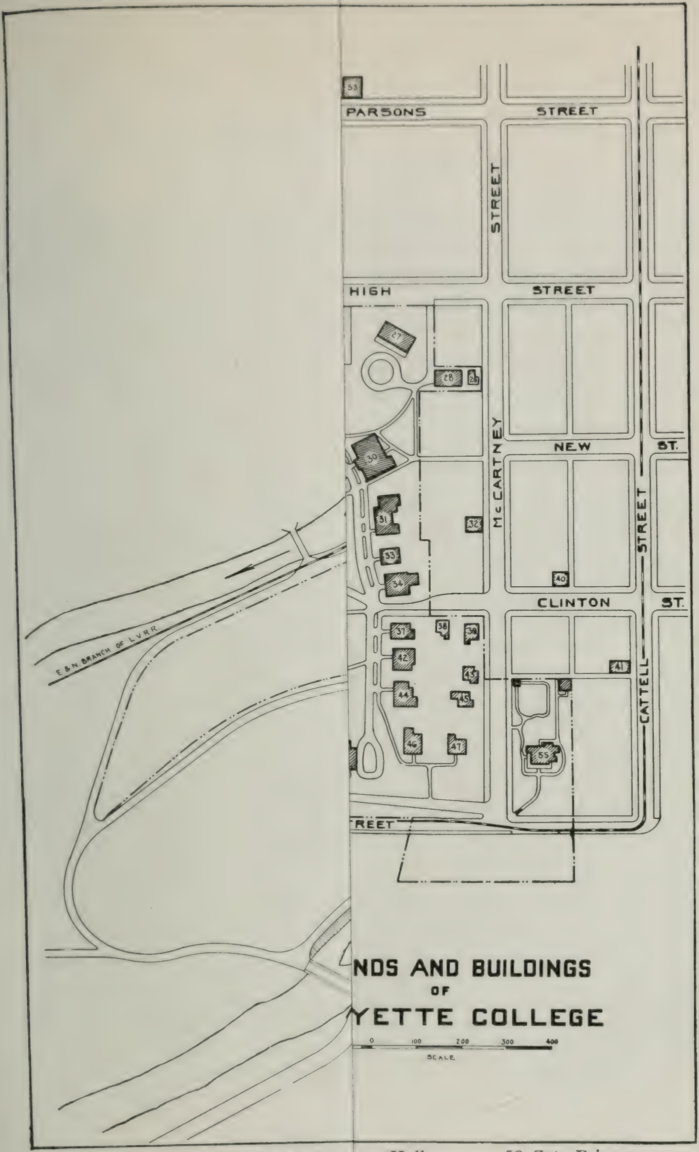
Inquiries regarding scholarship aid should be addressed to the ASSISTANT TO THE PRESIDENT.

Inquiries regarding students of the College, excuses from parents, etc., should be addressed to the DEAN.

Inquiries regarding dormitory rooms should be addressed to the SUPERINTENDENT OF BUILDINGS.

All payments and bills should be addressed to the BURSAR.

Correspondence regarding the general interests of the College should be addressed to the PRESIDENT.



1 South College.
2 West Tennis Courts.
3 Chi Phi.
4 Delta Tau Delta.
5 Professor Rankin.
6 Professor Martin.
7 College Offices.
8-9 Field Houses.
10 Theta Delta Chi

11 Gymnasssor Hall.
12 Van Wicssor Peck.
13 Phi Deltssor Lyle.
14 Greenhossor Kunkel.
15 Gayley I Laboratory of
istry. logy.
16 Delta K Plant.
17 Mechasor Hart.
neerine Laboratory.

52 Zeta Psi.
53 Omega Delta Phi.
54 Tennis Courts.
55 Pres. MacCracken.

CORRESPONDENCE

Correspondence addressed Lafayette College, Easton, Pennsylvania, may be expected to reach the proper department. To avoid delay, however, correspondents are requested to address letters as follows:

Requests for catalogs and inquiries regarding admission should be addressed to the REGISTRAR.

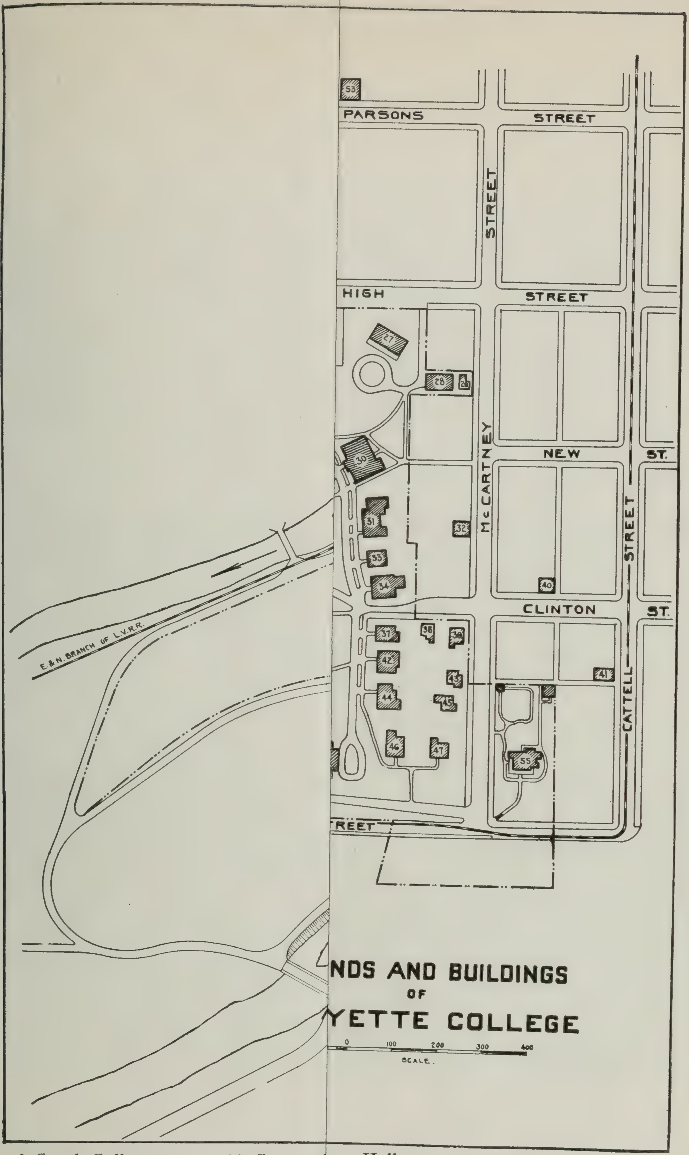
Inquiries regarding scholarship aid should be addressed to the ASSISTANT TO THE PRESIDENT.

Inquiries regarding students of the College, excuses from parents, etc., should be addressed to the DEAN.

Inquiries regarding dormitory rooms should be addressed to the SUPERINTENDENT OF BUILDINGS.

All payments and bills should be addressed to the BURSAR.

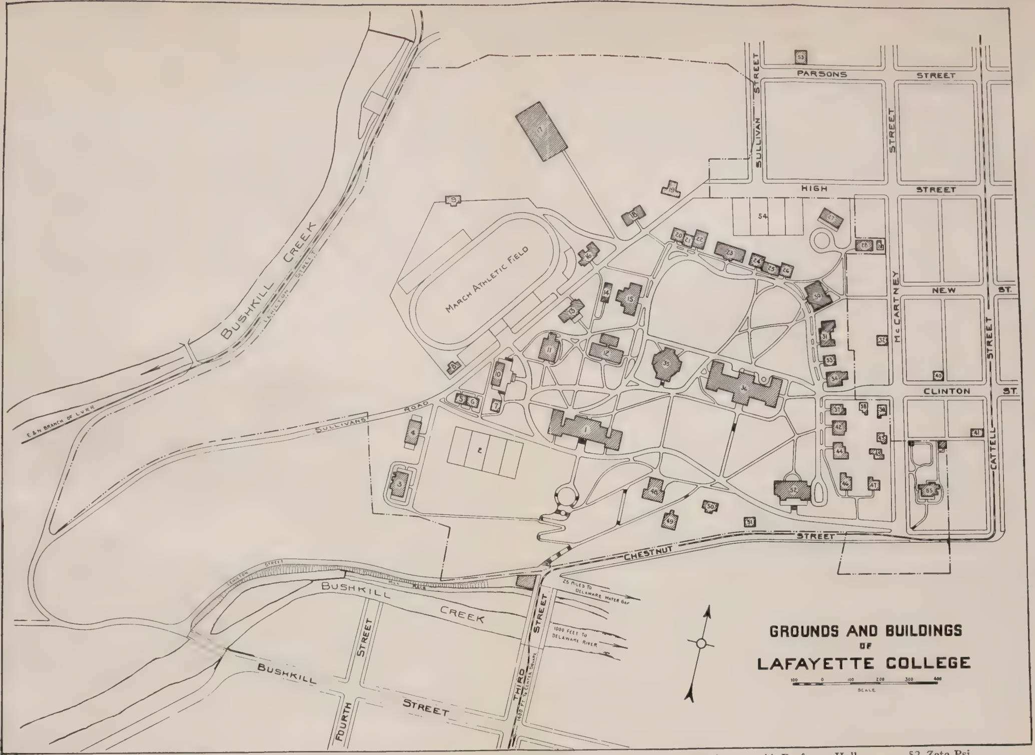
Correspondence regarding the general interests of the College should be addressed to the PRESIDENT.



1 South College.
2 West Tennis Courts.
3 Chi Phi.
4 Delta Tau Delta.
5 Professor Rankin.
6 Professor Martin.
7 College Offices.
8-9 Field Houses.
10 Theta Delta Chi

11 Gymnassor Hall.
12 Van Wicsor Peck.
13 Phi Deltsor Lyle.
14 Greenhosor Kunkel.
15 Gayley I Laboratory of
istry. logy.
16 Delta K Plant.
17 Mecha sor Hart.
neerin e Laboratory.

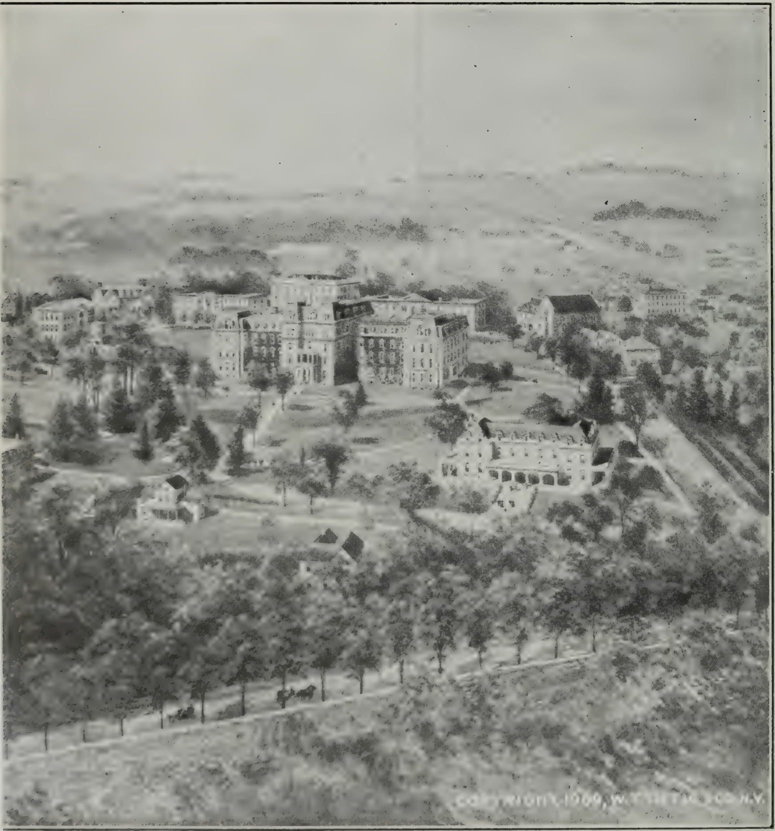
52 Zeta Psi.
53 Omega Delta Phi.
54 Tennis Courts.
55 Pres. MacCracken.



GROUNDS AND BUILDINGS OF LAFAYETTE COLLEGE

1	South College.
2	West Tennis Courts.
3	Chi Phi.
4	Delta Tau Delta.
5	Professor Rankin.
6	Professor Martin.
7	College Offices.
8–9	Field Houses.
10	Theta Delta Chi
11	Gymnasium.
12	Van Wickle Library.
13	Phi Delta Theta.
14	Greenhouse.
15	Gayley Hall of Chemistry.
16	Delta Kappa Epsilon.
17	Mechanical Engineering Building.
18	Phi Kappa Psi.
19	Traill Green Observatory.
20	Blair Hall.
21	Knox Hall.
22	Newkirk Hall.
23	McKeen Hall.
24	Martien Hall.
25	Fayerweather Hall.
26	Powell Hall.
27	Phi Gamma Delta.
28	East College.
29	Infirmary.
30	Brainerd Hall.
31	Delta Upsilon.
32	Alpha Chi Rho.
33	Professor March.
34	Professor Tupper.
35	Memorial Chapel.
36	Pardee Hall.
37	Professor Youngman.
38	Professor Fehr.
39	Professor Wysor.
40	Sigma Chi.
41	Sigma Nu.
42	Professor Gordon.
43	Professor Owen.
44	Professor Hall.
45	Professor Peck.
46	Professor Lyle.
47	Professor Kunkel.
48	Jenks Laboratory of Biology.
49	Steam Plant.
50	Professor Hart.
51	Private Laboratory.
52	Zeta Psi.
53	Omega Delta Phi.
54	Tennis Courts.
55	Pres. MacCracken.

LAFAYETTE COLLEGE, EASTON, PENNSYLVANIA.



ASTON, PENNSYLVANIA.

CATALOG

OF

LAFAYETTE COLLEGE

Eighty-Fifth Year
1916-1917

EASTON, PENNSYLVANIA

CONTENTS

Calendar.......... 4
Trustees.......... 6
Faculty.......... 8
Officers of Administration.......... 12
Origin and History.......... 13
Location.......... 14
Admission.......... 15
Curriculum.......... 22
Exhibit of Studies..........26–35
I-III—Arts and Pure Science:
  Leading to Degree of Bachelor of Arts.......... 26
    of Bachelor of Philosophy.......... 27
    of Bachelor of Science.......... 28
IV—Technical Courses. Leading to Degree of Bachelor of Science:
  in Chemical Engineering.......... 31
  in Civil Engineering.......... 32
  in Electrical Engineering.......... 33
  in Mechanical Engineering.......... 34
  in Mining Engineering.......... 35
V—Leading to Degree of Bachelor of Science in Chemistry.......... 30
  Two-year course for Pre-medical students.......... 29
Time Schedules..........36–45
Courses of Instruction by Departments:
    Bible.......... 46
  Group I—Language and Literature:
    English.......... 46
    Greek.......... 48
    Latin.......... 51
  Modern Languages:
      French.......... 52
      German.......... 53
      Italian.......... 54
      Spanish.......... 54
  Group II—Education, History, Philosophy and Political Science:
    Economics.......... 55
    Government and Law.......... 56
    History.......... 56
    Philosophy and Education.......... 57
    Sociology.......... 58

Group III—Mathematics and Science:

Biology.......... 58
Chemistry and Metallurgy.......... 59
Geology.......... 63
Graphics.......... 63
Mathematics.......... 65
Physics.......... 67

Group IV—Engineering:

Civil Engineering.......... 68
Electrical Engineering.......... 75
Mechanical Engineering.......... 77
Mining Engineering.......... 83
Physical Training and Hygiene.......... 84
Fees and Expenses.......... 86
Scholarships.......... 88
Rooms and Board.......... 90
Medical Treatment.......... 90
Buildings.......... 90
Library and Reading-Room.......... 94
Scientific Collections.......... 96

General Information:

Attendance.......... 96
Examinations and Standing.......... 97
Graduation and Degrees.......... 97, 98
Masters' Degrees.......... 98
Terms and Vacations.......... 98
Prizes.......... 99
Religious Instruction.......... 102
Public Lectures.......... 104
College Societies.......... 104
College Athletics and Publications.......... 106
Degrees Conferred 1916.......... 107
Honors and Prizes 1916.......... 109
Alumni Associations.......... 114
Roll of Students.......... 117
Index.......... 135
Form of Bequest.......... cover

CALENDAR

1916.

Nov. 29—Wednesday, 12 M., to Dec. 4, Monday, 10 A.M., Thanksgiving recess.

Dec. 20—Wednesday, 12 M., Christmas recess begins.

1917.

Jan. 4—Thursday, 8 A.M., Christmas recess ends.

Jan. 31—Wednesday, 12 M., First term ends.

Feb. 1—Thursday, 11.30 A.M., Stated Meeting of the Board of Trustees.

Feb. 1-4—Thursday-Sunday, Junior Week recess.

Feb. 5—Monday, 8 A.M., Second term begins.

Feb. 15—Thursday, Day of Prayer for Colleges, Service at 11 A.M.

Apr. 4—Wednesday, 12 M., Easter vacation begins.

Apr. 12—Thursday, 8 A.M., Easter vacation ends.

May 3—Thursday, 11.30 A.M., Stated Meeting of the Board of Trustees.

May 30—Wednesday, Memorial day. Holiday.

June 7—Thursday, Summer course in surveying begins.

June 9—Saturday, Examinations end.

June 9—Saturday, Alumni Day.

June 10—Sunday, 10.30 A.M., Baccalaureate Sermon; 8 P.M., Sermon before Brainerd Society.

The program of Commencement week will be announced in February.

June 28—Thursday, Summer course in surveying ends.

Sept. 17—Monday, 9 A.M., to 12 M., 2 P.M. to 4 P.M., Registration for entrance.

Sept. 17-19—Monday, Tuesday, Wednesday, 9 A.M., Examinations for admission. Re-examinations, three upper classes.

Sept. 20—Thursday, 8 A.M., 86th College year begins. Opening Address in Pardee Auditorium at eleven o'clock.

Oct. 4—Thursday, 11.30 A.M., Meeting of the Board of Trustees.

Oct. 24—Wednesday, Founders' Day. Meeting of the Alumni Visiting Committees.

Nov. 28—Wednesday, 12 M., to Dec. 3, Monday 8, A.M., Thanksgiving recess.

Dec. 19—Wednesday, 12 M., Christmas recess begins.

1918.

Jan. 3—Thursday, 8 A.M., Christmas recess ends.

Jan. 30—Wednesday, 12 M., First term ends.

1918.

Jan. 31-Feb. 3—Thursday to Sunday, Junior Week recess.
Feb. 4—Monday, 8 A.M., Second term begins.
Feb. 7—Thursday, Stated Meeting of the Board of Trustees.
Feb. 21—Thursday, Day of Prayer for Colleges, service at 11 A.M.
Mar. 27—Wednesday, 12 M., Easter vacation begins.
Apr. 4—Thursday, 8 A.M., Easter vacation ends.
May 2—Thursday, 11.30 A.M., Stated Meeting of the Board of Trustees.
May 30—Thursday, Memorial Day. Holiday.
June 8—Saturday, Examinations end.
June 8—Saturday, Alumni Day.
June 9—Sunday, 10.30 A.M., Baccalaureate Sermon; 8 P.M., Sermon before Brainerd Society.

Commencement week program will be announced later.

TRUSTEES

LIFE TRUSTEES

John Welles Hollenback, Esq.	Wilkes-Barre, Pa.
Hon. William S. Kirkpatrick, LL.D. *Vice-President*	Easton, Pa.
Rev. Ethelbert D. Warfield, D.D., LL.D.	Chambersburg, Pa.
Isaac P. Hand, Esq.	Wilkes-Barre, Pa.
James Gayley, M.E., Sc.D.	New York City.
Rev. D. J. Waller, Jr., Ph.D., D.D.	Bloomsburg, Pa.
Israel P. Pardee, M.E., *President*	Hazleton, Pa.
Charles B. Adamson, M.S.	Philadelphia, Pa.
J. Renwick Hogg, A.M.	Philadelphia, Pa.
McCluney Radcliffe, M.D., LL.D.	Philadelphia, Pa.
Rev. Leighton W. Eckard, D.D.	Philadelphia, Pa.
Edgar M. Green, M.D.	Easton, Pa.
John Markle, M.E.	Jeddo, Pa.
Edward J. Fox, Esq.	Easton, Pa.
David Bennett King, Esq., *Secretary*	New York City.
Nathan Grier Moore, Esq.	Chicago, Ill.
William E. Baker, C.E.	New York City.
Rev. John B. Laird, D.D.	Frankford, Pa.
John E. Fox, Esq.	Harrisburg, Pa.
Rev. Albert J. Weisley, D.D.	Scranton, Pa.
Simon Cameron Long, C.E.	Philadelphia, Pa.
John H. MacCracken, Ph.D., LL.D.	Easton, Pa.
Thomas Fisher, Esq.	Philadelphia, Pa.
John T. Manson, Esq.	New Haven, Conn.
Fred Morgan Kirby, Esq.	Wilkes-Barre, Pa.

ALUMNI TRUSTEES

Class of 1918

William A. May, A.M., C.E.	Scranton, Pa.
Harry N. Hempstead, Esq.	New York City.

Class of 1920

Charles Heebner, Esq.	Philadelphia, Pa.
J. George Becht, Sc.D.	Harrisburg, Pa.

Class of 1922

A. C. Overholt, B.S., A.M.	Scottdale, Pa.
Carroll P. Bassett, C.E.	Summit, N. J.

STANDING COMMITTEES OF THE BOARD OF TRUSTEES

Executive Committee

Messrs. MacCracken, Pardee, Kirkpatrick, E. J. Fox and Baker

Increase of the Endowment and Equipment of the College

Messrs. Baker, E. J. Fox, Gayley, Markle, Hogg, Overholt and Heebner

Vacancies

Messrs. MacCracken, Hollenback, Hand, Gayley and Waller

Liberal Arts Curriculum

Messrs. Waller, Becht, Laird, King and Moore

Technical Curriculum

Messrs. Gayley, Baker, Markle, May and Long

Honorary Degrees

Messrs. Kirkpatrick, Eckard, King, Green and Laird

Library

Messrs. Moore, King, Adamson, J. F. Fox and Weisley

Athletics

Messrs. J. E. Fox, Radcliffe, Overholt and Hempstead

Fraternity Houses

Messrs. Radcliffe, Becht, Green and Heebner

Investments

Messrs. E. J. Fox, Hogg and Markle

The president of the Board and the President of the College are members of all standing committees *ex officio.*

CO-OPERATIVE ENGINEERING ADVISORY BOARD

George R. Elder, Vice-President and General Manager Ingersoll-Rand Co., Chairman.

Knox Taylor, President Taylor-Wharton Iron and Steel Co.

Ralph H. Sweetser, Formerly President Thomas Iron Co.

Israel P. Pardee, President Board of Trustees, Lafayette College.

James Gayley, Member Board of Trustees, Lafayette College.

A. C. Overholt, Member Board of Trustees, Lafayette College.

John H. MacCracken, President Lafayette College.

E. O. Fitch, Jr., Professor of Mechanical Engineering, Lafayette College, Secretary.

FACULTY

John Henry MacCracken, Ph.D., LL.D. Chestnut St.
President
John I. Blair Foundation.

Rev. Robert Barber Youngman, A.M., Ph.D. Campus
Emeritus Professor of the Greek Language and Literature

William Baxter Owen, A.M., Ph.D., Litt.D. McCartney St.
Professor of the Latin Language and Literature

Edward Hart, Ph.D. Campus
Dean of the Pardee Scientific Department; Professor of Chemical Engineering

James Madison Porter, C.E. 53 North Third St.
Professor of Civil Engineering and Director of the Division; Chairman of the Engineering Council

Francis A. March, Jr., A.M., Ph.D. Campus
Professor of the English Language
Francis A. March Professorship.

William Shafer Hall, C.E., E.M., M.S. Campus
Professor of Mathematics; Clerk of the Faculty
George W. Hollenback Professorship.

Edgar Moore Green, A.M., M.D. 222 Spring Garden St.
Consulting Physician in the Department of Physical Training

Frederick Burritt Peck, Ph.D. McCartney St.
Professor of Mineralogy and Geology

Clarence McCheyne Gordon, Ph.D. Campus
Professor of Physics

James Waddell Tupper, Ph.D. Campus
Professor of English Literature
Secretary of the Arts and Science Council

James Theron Rood, Ph.D. 424 Clinton St.
Professor of Electrical Engineering and Director of the Division

William Thomas Lyle, C.E. Campus
Professor of Municipal Engineering

Edwin Moore Rankin, A.M., Ph.D. Campus
Professor of Greek.

EDWIN OBERLIN FITCH, JR., M.S. 110 Wayne Ave.
Professor of Mechanical Engineering and Director of the Division

HENRY WYSOR, B.S. Campus
Professor of Metallurgy

OTHO MCCARROLL GRAVES, B.S. in C.E. 315 Lafayette St.
Professor of Graphics.
Secretary of the Engineering Council

REV. SAMUEL ALBERT MARTIN, A.M., D.D. Campus
Professor of Mental and Moral Philosophy; Chairman of the Arts and Science Council
James Renwick Hogg Professorship.

CARL DANIEL FEHR, A.M. Campus
Professor of Modern Languages

WILLIAM MACKAY SMITH, PH.D. 331 Bushkill St.
Associate Professor of Mathematics and Registrar

BEVERLY WAUGH KUNKEL, PH.D. Campus
Professor of Biology
Jesse Chamberlain Professor of Botany.

ALBERT K. HECKEL, PH.D. 731 Reeder St.
Professor of History and Dean of the College

FRANCIS WILBUR DICKEY, M.A. 609 Mixsell St.
Professor of Government and Economics

EUGENE C. BINGHAM, PH.D. 440 Porter St.
Professor of Chemistry and Director of the Gayley Laboratory
William Adamson Professorship of Analytical Chemistry.

HAROLD MCAFEE ROBINSON, B.D. Campus
Helen H. P. Manson Professor of Bible and College Pastor

JAMES BRYANT HOPKINS, A.M. 614 Coleman St.
Assistant Professor of Romance Languages

WILLIAM BENJAMIN MARQUARD, E.M. 626 Parsons St.
Assistant Professor of Mining Engineering
George B. Markle Professorship

ERNEST DEAN TANZER, E.E. Mattes Lane
Assistant Professor of Electrical Engineering

Raymond Henry Lacey, A.M., Ph.D. — 120 Porter St.
Assistant Professor of Latin

William Trumbower Foster, Ph.B., M.S. — 707 Coleman St.
Assistant Professor of Biology

D. Arthur Hatch, E.M. — 705 High St.
Assistant Professor of Mathematics

Harry Thomas Spengler, C.E. — 377 Shawnee Drive
Assistant Professor of Surveying and Railroad Engineering

V. Ray Jones, A.M. — South College
Assistant Professor of German

J. Hunt Wilson, Ph.D., — 531 Cattell St.
Assistant Professor of Chemistry

James Henry DeLong, B.S. — 906 McCartney St.
Instructor in Chemistry

William Huntington Kirkpatrick, A.B. — 123 Reeder St.
Instructor in Municipal Law

Harold Anson Bruce — Blair Hall
Director of Physical Training

John Cawley, M.S. — 627 Coleman St.
Instructor in Mathematics

A. Henry Fretz, Ph.B., C.E. — 400 Reeder St.
Instructor in Geology and Mineralogy

Harold John Lockwood, E.E. — 624 Parsons St.
Instructor in Physics

Clifford Elliott Williams, B.S., in C.E. — 625 Monroe St.
Instructor in Cement Engineering

Arthur Dodd Snyder, A.B. — 15 South 11th St.
Instructor in Mathematics

Charles Garfield Eichlin, A.B. — 1627 Northampton St.
Instructor in Physics

Henry Clinton Hutchins, A.M. — 440 Porter St.
Instructor in English

Clinton Ellicott Pearce, B.S. — 100 Cattell St.
Instructor in Mechanical Engineering

William Wallaesa *Instructor in Foundry*	1106 Washington St.
Benjamin F. Luker, M.A. *Instructor in Romance Languages*	848 Paxinosa Ave.
Robert S. Johnston, B.S in C.E. *Instructor in Civil Engineering*	817 Porter St.
Luther A. Flowers *Instructor in Pattern Making*	721 Bushkill St.
E. A. Holden, B.S. in C.E. *Instructor in Graphics*	92 McKeen Hall
Norman Krichbaum, A.B. *Instructor in English*	509 High St.
Clarence C. Liggett, A.B. *Instructor in English*	101 McCartney St.
Pasquale Seneca *Instructor in Romance Languages*	848 Paxinosa Ave.
H. S. van Klooster, Ph.D. *Instructor in Chemistry*	509 High St.

STANDING COMMITTEES OF THE FACULTY 1917

Organization and By-Laws

Professors ROOD, FEHR, HALL, KUNKEL, MARCH, MARTIN, WILSON

Curriculum

Professors MACCRACKEN, BINGHAM, DICKEY, FITCH, PORTER, RANKIN, TUPPER

Terms and Vacations

Professors PECK, LYLE, TANZER

Schedule

Professors GRAVES, SMITH, FEHR

Accredited Schools and Admission

Professors SMITH, HECKEL, HALL

Attendance and Standing

Professors HALL, SMITH, HECKEL, BINGHAM, PORTER

Discipline

Professors HECKEL, GORDON, HATCH, LYLE, SPENGLER

Student Organizations

Professors GRAVES, DICKEY, HECKEL, JONES, ROBINSON

Publications
Professors Tupper, Smith, Lacey

Athletics
Professors March, Gordon, Heckel, Kunkel, Rood, Bruce, Crowell

Apparatus and Equipment
Professors Porter, Bingham, Fitch, Gordon, Kunkel

Library
Professors Stonecipher, Hart, Owen, Hopkins, Foster

Public Lectures and Entertainments
Professors Tupper, Marquard, Owen, Robinson, Wysor

OFFICERS OF ADMINISTRATION

John Henry MacCracken, PhD., LL.D. *President*	Administration
William S. Hall, C.E., E.M., M.S. *Clerk of the Faculty*	South College
Edward Hart, Ph.D. *Dean of the Pardee Scientific Department, and Librarian of the Henry W. Oliver Library*	Gayley Hall
Albert K. Heckel, Ph.D. *Dean of the College*	South College
William Mackay Smith, Ph.D. *Registrar*	South College
Rev. John F. Stonecipher, D.D. *Librarian*	Van Wickle Library
Rev. Maurice A. Filson, A.M. *Assistant Librarian*	Van Wickle Library
William T. Foster, M.S. *Curator of the Biological Museum*	Jenks Hall
Albert Moore Lane, Ph. B. *Bursar and Superintendent of Grounds and Buildings*	Administration
David B. Skillman, A.B. *Assistant to the President*	Administration
Harold McAfee Robinson, B.D. *College Pastor*	Brainerd Hall
John Edgar Fretz, A.M., M.D. *Physician*	Third and Spring Garden Sts.
Harold Anson Bruce *Director of Physical Training*	Gymnasium
Wilmer G. Crowell *Director of Athletics*	Administration

LAFAYETTE COLLEGE

ORIGIN AND HISTORY

The first organized movement to establish a college at Easton took the form of a meeting held on the evening of December 27, 1824, at White's Hotel, in the northeast corner of the Public Square. Due notice had been given and a large number of public-spirited citizens came together to talk the matter over. Col. Thomas McKeen presided. After full discussion, it was unanimously voted "That it is expedient to establish at this place an institution of learning in which the dead languages and the various branches of education and science usually taught in colleges, together with the French and German languages, civil and military engineering, and military tactics shall be taught."

General Lafayette had landed in New York City on the sixteenth of August preceding and his progress through the land had been marked by one continuous ovation. It was therefore resolved "That as a testimony of respect for the talents, virtues and signal service of General Lafayette in the great cause of freedom, the said institution be named Lafayette College."

James M. Porter, Joel Jones and Jacob Wagner were appointed a committee "to draft a memorial to the Legislature for a charter of incorporation and for legislative aid." The legislature granted the charter March 9, 1826. The Board of Trustees organized May 15, 1826, by electing James M. Porter, President, Joel Jones, Secretary, and Thomas McKeen, Treasurer. Attempts were made in 1827 and in 1828 to inaugurate instruction but it was not until February 6, 1832, that George Junkin was secured as President and the sixty-acre farm and buildings of Christopher Midler on the south bank of the Lehigh were leased for two years as a temporary site for the new institution.

The regular exercises of the college began May 9, 1832. Nine acres of the present sixty acres were purchased shortly after. Ground was broken for a building June, 1833. On July 4, 1833, the corner stone of the building now known as South College was laid with appropriate ceremonies. The building was completed and the formal inauguration exercises of the first president and faculty were held in the College Hall, May 1, 1834. In 1850 overtures were made to the Synod of Philadelphia and the college entered into formal relations with the Presbyterian Church. An amendment was secured to the Charter giving the Synod the right of nominating the trustees and instructors of the College. A subsequent amendment in 1884, restored the right of election to the Board of Trustees but continued to the Synod a right of veto upon such elections.

Pardee Hall, the gift of Ario Pardee, Esq., of Hazleton, was completed October 21, 1873, at a cost of over $200,000 and the Pardee Scientific Department established by large gifts for endowment from the same generous hand.

In 1907 an endowment fund of five hundred thousand dollars was secured in celebration of the seventy-fifth anniversary, the largest donors being Mr. and Mrs. Ralph Voorhees, Mr. Andrew Carnegie, and the General Education Board, who together subscribed one-half the amount. Additions were made to the campus from time to time through the gifts of Hon. John I. Blair and others, and buildings described elsewhere in this catalog were erected, until the investment in land and buildings now represents a million and a half dollars.

It is the aim of the trustees to maintain the institution as a college of liberal culture and technical training of the highest order, limited in numbers, loyal to Christian truth and ideals, and thoro in its discipline and instruction.

LOCATION

Lafayette College is situated upon a hill overlooking the city of Easton, Pennsylvania, the center of an urban population of something over forty thousand inhabitants. The site is one of remarkable beauty, immediately above the confluence of the Delaware and Lehigh rivers commanding fine views of the Delaware Valley and of the hills of New Jersey beyond. Its elevation on a limestone plateau a hundred and fifty feet above the river with a southern exposure and an uninterrupted sweep of open country to the Delware Water Gap and the Pocono Mountains twenty-five miles to the north furnishes natural conditions particularly favorable to health.

Easton is a railroad center and easily accessible from all directions. It is about seventy-five miles from New York, seventy from Philadelphia, eighty from Scranton, and one hundred from Wilkes-Barre and Harrisburg. The Lehigh Valley, Pennsylvania, N. J. Central, Phila. & Reading, D. L. & W., and L. & H. Railways afford convenient and rapid facilities for railway travel.

ADMISSION TO COLLEGE

CLASSIFICATION

All correspondence relating to admission of students should be addressed to the Registrar.

Students are classified upon entrance in five divisions according to the subjects presented for admission and the degrees which they seek, as follows:

Division I. Candidates for the Degree of Bachelor of Arts.

Division II. Candidates for the Degree of Bachelor of Philosophy.

Division III. Candidates for the Degree of Bachelor of Science.

Division IV. Candidates for the Degrees of Bachelor of Science in Chemical Engineering, in Civil Engineering, in Electrical Engineering, in Mechanical Engineering, in Mining Engineering.

Division V. Candidates for the Degree of Bachelor of Science in Chemistry. Students taking the two-year pre-medical course.

REQUIREMENTS FOR ADMISSION

It is expected that every applicant for admission shall have successfully completed at least the equivalent of a four-year high school course, averaging sixteen hours a week through four years, and shall be a young man of good moral character and good health.

Students who expect to enter Lafayette College upon graduation from an accredited preparatory school or a four-year high school should apply by mail to the Registrar for a blank "Entrance Certificate," which will be sent upon request. This certificate, when properly filled out and signed by the principal of the school, should be forwarded by him to the Registrar and the matriculation fee of ten dollars paid.

The Registrar will present the certificate to the faculty Committee on Admission of Students, and will advise the student whether the certificate meets the requirements for admission, or, if deficient, in what subjects the student must make further preparation.

Students who have not attended an accredited school, or whose preparation has been irregular or deficient in certain subjects, are required to show that they are qualified in the subjects required for admission by passing the examinations conducted by Lafayette College in September or the examinations conducted by the College Entrance Board in June.

All information concerning the time and the place of holding the

College Entrance Board examinations may be obtained from The Secretary, College Entrance Examination Board, 431 West 117th Street, New York City. The entrance examinations conducted by Lafayette College will be held in Easton on the three days preceding the opening of college in September.

Students entering Lafayette from other colleges are required to present an official record of their scholastic work and also a certificate of honorable dismissal.

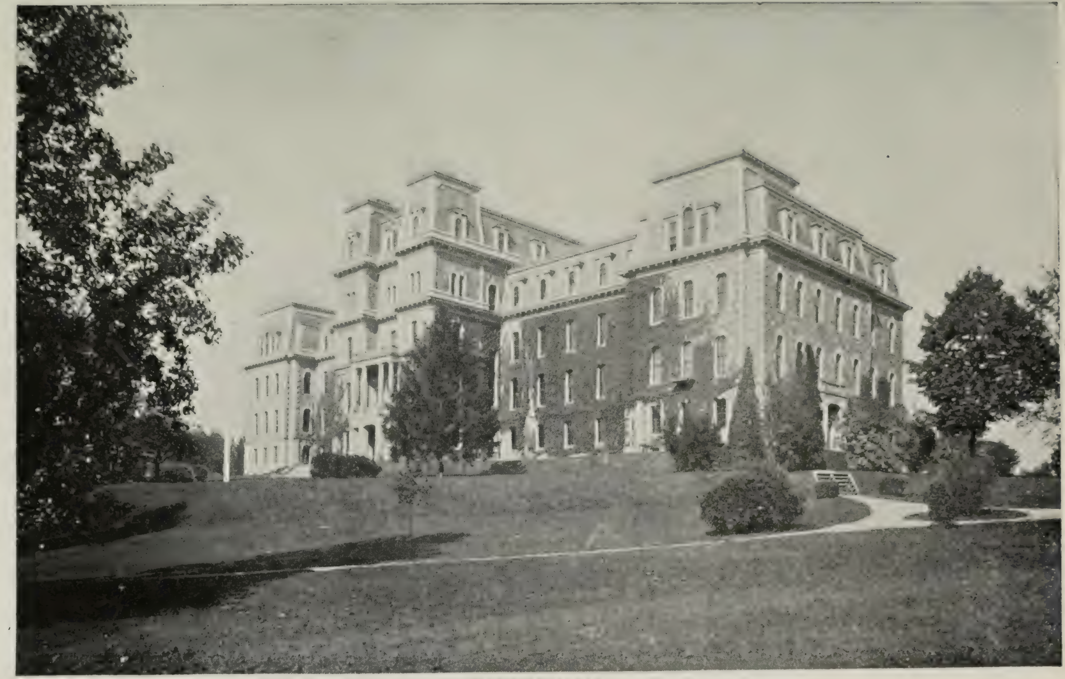
The admission requirements are reckoned in terms of units. A unit is defined as work in one subject which is equal to one-quarter of the entire work in the complete High School course for one year. This may mean a subject taken four or five periods a week throughout the school year, or two or three periods a week throughout two years. The requirement for all divisions of the Freshman class is fourteen and one-half units. The subjects required for the various divisions are given below.

For admission to Division I as a candidate for the Degree of Bachelor of Arts:

Subject	Units
English	3
History	1
Mathematics	2 1/2
Latin	3
Latin (one additional unit), Greek, or Modern Languages	4
Elective	1
Total	14 1/2

For admission to Division II as a candidate for the Degree of Bachelor of Philosophy:

English	3
History	1
Mathematics	2 1/2
Latin	3
Other Foreign Language	2
Science	1
Elective	2
	14 1/2



PARDEE HALL.

For admission to Division III as a candidate for the Degree of Bachelor of Science or to the pre-medical course:

English	3
History	1
Mathematics	$2\frac{1}{2}$
Foreign Language	2
Second Foreign Language or 3rd year For. Lang. 1, and Math. 1	2
Science	1
Elective	3
	$14\frac{1}{2}$

For admission to Division IV as a candidate for a degree in Engineering or to Division V as a candidate for a degree in Chemistry:

English	3
History	1
Mathematics	4
Modern Foreign Language	2
Physics or Chemistry	1
Elective	$3\frac{1}{2}$
	$14\frac{1}{2}$

Any of the subjects defined below except English may be offered as electives.

DEFINITION OF REQUIREMENTS

English.................................... 3 units

1. A command of correct and clear English, spoken and written.
2. A careful reading knowledge of works elected from the prescribed groups—classics in translation, Shakespeare, prose fiction, essays and biography, and poetry.

Books to be read: 1917-19.

Group I.—Classics in Translation. The *Old Testament*, comprising at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings, and Daniel, together with the books of Ruth and Esther. The *Odyssey*, with the omission, if desired, of Books I, II, III, IV, V, XV, XVI, XVII. The *Iliad*, with the omission, if desired, of Books XI, XIII, XIV, XV, XVII, XXI. The *Aeneid*. The *Odyssey*, *Iliad* and *Aeneid* should be read in English translations of recognized literary excellence. For any selection from this group a selection from any other group may be substituted.

Group II.—Shakespeare. *Midsummer Night's Dream, Merchant of Venice, As You Like It, Twelfth Night, The Tempest, Romeo and Juliet, King John, Richard II, Richard III, Henry V, Coriolanus, Julius Caesar, Macbeth, Hamlet.*

Group III.—Prose Fiction. Malory: *Morte d'Arthur* (about 100 pages); Bunyan: *Pilgrim's Progress*, Part I; Swift: *Gulliver's Travels* (voyages to Lilliput and to Brobdingnag); Defoe: *Robinson Crusoe*, Part I; Goldsmith: *Vicar of Wakefield;* Frances Burney: *Evelina;* Scott's Novels: any *one;* Jane Austen's novels: any *one;* Maria Edgeworth: *Castle Rackrent*, or *The Absentee;* Dickens' novels: any *one;* Thackeray's novels: any *one;* George Eliot's novels: any *one;* Mrs. Gaskell: *Cranford;* Kingsley: *Westward Ho;* or *Hereward, the Wake;* Reade: *The Cloister and the Hearth;* Blackmore: *Lorna Doone;* Hughes: *Tom Brown's Schooldays;* Stevenson's *Treasure Island*, or *Kidnapped*, or *Master of Ballantrae;* Cooper's novels: any *one;* Poe: *Selected Tales;* Hawthorne: *The House of the Seven Gables*, or *Twice Told Tales*, or *Mosses from an Old Manse;* A collection of *Short Stories* by various standard writers.

Group IV.—Essays, Biography, Etc. Addison and Steele: *The Sir Roger de Coverley Papers*, or Selections from the *Tatler* and *Spectator* (about 200 pages); Boswell: Selections from the *Life of Johnson* (about 200 pages); Franklin: *Autobiography;* Irving: Selections from the *Sketch Book* (about 200 pages), or *Life of Goldsmith;* Southey: *Life of Nelson;* Lamb: Selections from the *Essays of Elia* (about 100 pages); Lockhart: Selections from the *Life of Scott* (about 200 pages); Thackeray: Lectures on *Swift, Addison*, and *Steele* in the *English Humorists;* Macaulay: Any one of the following essays: *Lord Clive, Warren Hastings, Milton, Addison, Goldsmith, Frederick the Great, Madame d'Arblay;* Trevelyan: Selections from the *Life of Macaulay* (about 200 pages); Ruskin: *Sesame and Lilies*, or *Selections* (about 150 pages); Dana: *Two Years before the Mast;* Lincoln: *Selections*, including at least the two *Inaugurals*, the *Speeches in Independence Hall* and *at Gettysburg*, the *Last Public Address*, the *Letter to Horace Greeley;* together with a brief memoir or estimate of Lincoln; Parkman: *The Oregon Trail;* Thoreau: *Walden;* Lowell: *Selected Essays* (about 150 pages); Holmes: *The Autocrat of the Breakfast Table;* Stevenson: *An Inland Voyage* and *Travels with a Donkey;* Huxley: *Autobiography* and selections from *Lay Sermons*, including the addresses on *Improving Natural Knowledge, A Liberal Education*, and *A Piece of Chalk;* A collection of *Essays* by Bacon, Lamb, DeQuincey, Hazlitt, Emerson, and later writers; a collection of *Letters* by various standard writers.

Group V.—Poetry. Palgrave's *Golden Treasury* (First Series), Books I and III, with special attention to Dryden, Collins, Gray, Cowper, and Burns; Palgrave's *Golden Treasury* (First Series), Book IV, with special attention to Wordsworth, Keats, and Shelley (if not chosen for study under 3); Goldsmith: *The Traveller* and *The Deserted Village;* Pope: *The Rape of the Lock;* A collection of English and Scottish *Ballads*, as, for example, some *Robin Hood* ballads, *The Battle of Otterburn, King Estmere, Young Beichan, Berwick and Grahame, Sir Patrick Spens*, and a selection from later ballads; Coleridge: *The Ancient Mariner, Christabel*, and *Kubla Khan;* Byron: *Childe Harold*, Canto III or IV, and *The Prisoner of Chillon;* Scott: *The Lady of the Lake*, or *Marmion;* Macaulay: *The Lays of Ancient Rome, The Battle of Naseby, The Armada, Ivry;* Tennyson: *The Princess*, or *Gareth and Lynette, Lancelot and Elaine*, and *The Passing of Arthur;* Browning: *Cavalier Tunes, The Lost Leader, How They Brought the Good News from Ghent to Aix, Home Thoughts from Abroad, Home Thoughts from the Sea, Incident of the French Camp, Hervé Riel, Pheidippides, My Last Duchess, Up at a Villa—Down in the City, The Italian in England, The Patriot, The Pied

Piper, "*De Gustibus—*," *Instans Tyrannus;* Arnold: *Sohrab and Rustum*, and *The Forsaken Merman;* Selections from *American Poetry*, with special attention to Poe, Lowell, Longfellow, and Whittier.

3. An exact textual knowledge of works elected from the prescribed groups—drama, poetry, oratory, and essays.

Books to be studied: 1917-19 (one to be selected from each group).

Group I.—Drama. Shakespeare: *Julius Caesar*, *Macbeth*, *Hamlet*.

Group II.—Poetry. Milton: *L'Allegro*, *Il Penseroso*, and either *Comus* or *Lycidas;* Tennyson: *The Coming of Arthur*, *The Holy Grail*, and *The Passing of Arthur;* The selections from Wordsworth, Keats, and Shelley in Book IV of Palgrave's *Golden Treasury* (First Series).

Group III.—Oratory. Burke: *Speech on Conciliation with America;* Macaulay's Two *Speeches on Copyright* and Lincoln's *Speech at Cooper Union;* Washington's *Farewell Address* and Webster's *First Bunker Hill Oration*.

Group IV.—Essays. Carlyle: *Essay on Burns*, with a selection from Burns' *Poems;* Macaulay: *Life of Johnson;* Emerson: *Essay on Manners*.

History

English History	1 unit
American History	1 unit
Ancient History	$^1/_2$ or 1 unit
Mediaeval History	$^1/_2$ or 1 unit

Each of the above topics is intended to represent one year of historical work in which the study is given five times per week; or two years of historical work in which the study is given three times per week.

The examination in history will be so framed as to require comparison and the *use of judgment* on the pupil's part rather than the mere use of memory. The examinations will presuppose the use of good text-books, collateral reading, and practice in written work. Geographical knowledge will be tested by requiring the location of places and movements on an outline map.

Mathematics

Elementary Algebra including Quadratics..... $1^1/_2$ units

Fundamental principles. Factoring. Fractions. Simple Equations. Involution. Evolution. Exponents. Quadratic Equations. Simultaneous Quadratic Equations. Equations Solved as Quadratics. Properties of Quadratic Equations.

Advanced Algebra.......................... $^1/_2$ unit

Surds and Imaginaries. Simple Indeterminate Equations. Inequalities. Ratio. Proportions and Variations. Progressions.

Plane Geometry............................ 1 unit

Plane Geometry entire; as in Wentworth, Wells or Loomis.

Solid Geometry............................ 1/2 unit

Trigonometry............................. 1/2 unit

Through the solution of right and oblique triangles (Hall and Funk's *Trigonometry* or an equivalent). Candidates should bring their logarithmic tables to the examination.

Latin, Elementary.................................. 3 units

(*a*) Grammar.

(*b*) Caesar's Commentaries, four books, or a portion in Nepos, Cicero's *de Senectute,* or *de Amicitia.*

(*c*) Cicero, Seven Orations.

(*d*) Prose Composition.

Latin, Advanced..................................... 1 unit

(*a*) Virgil, *Aeneid,* six books, *Bucolics.*

(*b*) Prose Composition.

Greek, Elementary.................................. 2 units

(*a*) Grammar.

(*b*) Xenophon, *Anabasis,* four books or equivalent in the *Cyropaedia.*

(*c*) Prose Composition.

Greek, advanced..................................... 1 unit

(*a*) Homer, *Iliad,* three books, or *Odyssey,* three books.

(*b*) Prose Composition.

French, Elementary.................................. 2 units

(*a*) Grammar. Two-year course.

(*b*) Approved Readings. Two-year course.

This embraces a thorough knowledge of the rudiments of grammar, including the inflection of the regular and the more common irregular verbs; the inflection of nouns and adjectives for gender and number; the uses of articles and partitive constructions; the forms and positions of personal pronouns; the uses of the other pronouns. Candidates should be able to read at sight ordinary modern prose. It is believed that this ability is acquired by reading two hundred duodecimo pages from the works of at least three different authors.

French, Advanced..................................... 1 unit

(*a*) Grammar and Conversation.

(*b*) Advanced Readings.

Candidates should show a thorough knowledge of accidence, and a familiarity with the essentials of French syntax, especially the uses of the tenses, modes, prepositions and conjunctions. They must be able to translate into French a connected passage of simple English, and to translate at sight standard French authors. This proficiency may be acquired by reading, in addition to that required under elementary French, not less than four hundred pages of the works of various standard authors.

German, Elementary............................ 2 units

(*a*) Grammar. Two-year course.

(*b*) Approved Readings. Two-year course.

At the end of the elementary course in German the student should be able to read at sight and to translate a passage of very easy dialogue or narrative prose. He should also be able to put into German short English sentences, and to answer questions upon the rudiments of grammar. He should have read at least two hundred pages of literature in the form of easy stories or plays.

German, Intermediate............................ 1 unit

(*a*) Grammar and Conservation.

(*b*) Advanced Readings.

This includes a thorough knowledge of accidence, of the elements of word-formation, and of the principal uses of the prepositions and conjunctions. The candidate should be familiar with the essentials of German syntax, and must possess the ability to translate into German easy English prose; to translate at sight passages from standard classical authors. The reading of at least three hundred and fifty pages in addition to that required under elementary German will develop such ability. For examination no specific authors or works are designated.

Spanish, Elementary............................ 2 units

(*a*) Grammar. Two-year course.

(*b*) Approved Readings. Two-year course.

Physics.. 1 unit

Chemistry...................................... 1 unit

Zoölogy and Botany............................. 1 unit

Physical Geography............................. 1 unit

The work in each science should consist of recitations and of practical experiments performed in a laboratory equipped with sufficient apparatus. A neatly kept note-book with experiments recorded in the student's own words is required.

Drawing.. 1 unit

Either Freehand Drawing (1/2 unit) or Projection Drawing (1/2 unit) or both.

THE CURRICULUM

ARRANGEMENT OF COURSES OF STUDY

Arts and Pure Science.—Lafayette College offers three parallel courses in the liberal arts and sciences extending through four years and leading, respectively, to the degrees of Bachelor of Arts, Bachelor of Philosophy and Bachelor of Science. The course leading to the degree of Bachelor of Arts is distinguished from the course leading to the degree of Bachelor of Philosophy chiefly by the requirement of, at least, two years study of the Greek language. The curriculum leading to the degree of Bachelor of Science differs from the curriculum leading to the degree of Bachelor of Philosophy chiefly in the fact that less time is given to the study of languages and more time to the sciences and to mathematics. Any one of these three courses of study successfully completed will give the student a liberal education, and serve as a basis for professional study or for business life.

Engineering.—Lafayette College offers also five parallel technical courses in engineering extending through four years and leading, respectively, to the degrees of Bachelor of Science in Chemical Engineering, in Civil Engineering, in Electrical Engineering, in Mechanical Engineering, and in Mining Engineering. An effort has been made to keep the curriculum as nearly as possible the same in the Freshman and Sophomore years for these five groups, so as to enable the student to defer until the close of Sophomore year the choice of his special branch of Engineering. While it has not been possible to do this fully, the variations are not so great as to prevent a student who desires to change from one of these courses to another at the end of Sophomore from making up by additional work the one or two subjects in which he may be deficient. While these courses are technical and professional, the college recognizes that professional training must include as broad culture as the time at the disposal of the student will permit and makes provision, therefore, in these technical courses also for the study of English, and for electives in History, Economics, Government, Business Law, etc. The strictly professional degree of Engineer (C.E., M.E., etc.) will be given in 1919 and thereafter only upon the completion of three years' practical experience in the profession and the presentation of an acceptable thesis.

Chemistry.—Lafayette College offers also a technical course in Chemistry preparing students for the profession of Chemist. This also is a professional course with which is combined such broader cultural studies as time will permit.

Medical Preparatory.—Lafayette College offers to students preparing for the study of Medicine, a two years' course permitting intensive study of Chemistry, Physics and Biology with some study of German and such opportunity for the election of other college subjects as time will permit.

FRESHMAN AND SOPHOMORE YEARS

The work of the Freshman and Sophomore years is largely required. Greek is required of candidates for the A.B. degree. Those entering with Greek must take it for one year; those beginning Greek in college, for two years. Mathematics is required of candidates for the B.S. degree or the degrees in Engineering throughout the two years. Latin and a Modern Language are required of candidates for the degree of Ph.B., throughout the two years. In the Sophomore year, an opportunity is given to elect courses in English, Science, History, and Government. Bible is required two hours a week for one term each year throughout the four years. Hygiene and Physical Training is required four times a week of all Freshmen. The curriculum of each Division is shown in the following tables. The course numbers refer to the courses as listed in the announcements of the Departments following the tables (see pages 46–83).

The tables show the number of hours per week spent in the classroom and in the laboratory, and the number of hours credit allowed in each course toward a degree.

JUNIOR AND SENIOR YEARS

THE GROUP SYSTEM IN ARTS AND PURE SCIENCE

The requirements for the Junior and Senior years are the same for all students in the liberal arts courses, *viz.*, Divisions I, II and III. All the Departments offering courses in Divisions I, II and III in Arts and Pure Science are arranged in three groups as follows:

Group I: Language and Literature including English.
Group II: History, Philosophy and Political Science.
Group III: Mathematics and Science.

At the end of Sophomore year each student in Divisions I, II and III must decide in which department he wishes to do the larger part of his advanced work. Each student in Division IV must decide whether to specialize in Chemical, Civil, Electrical, Mechanical or Mining Engineering. Students in Mechanical Engineering must decide whether to take the four-year course or the five-year co-operative course.

The department selected by the student in Divisions I–III will be known as his *Major Department.* The completion of three 3-hour year courses or the equivalent in that department will constitute a *Major.* Courses designated as preliminary courses cannot be counted as part of this requirement.

The student must also, at the same time, choose two other departments, one from each of the remaining groups, as his first and second Minor Departments. The completion of two 3-hour year courses or the equivalent, in one department will constitute a *Minor.* Courses designated as preliminary courses in the department cannot be counted as part of this requirement.

Of the work of the Junior and Senior years, therefore, six hours one year and three hours the second year, or *vice versa,* all taken in one department will be required to complete the *Major,* and three hours throughout the two years in one department of a different group, and three hours throughout the two years in the remaining group will be required to complete the two *Minors.* In addition to the twenty-one hours thus required nine hours of electives must be completed in the two years in order to satisfy the requirements for the respective degrees. These electives may be selected from any courses open to Juniors and Seniors. (See pages 40–41.)

Bible two hours a week for one term each year is required in addition of all students.

SPECIMEN JUNIOR AND SENIOR CURRICULUM

LEADING TO THE DEGREES OF A.B., Ph.B., AND B.S.

Junior Year		*Senior Year*	
Major, Group I, II, III	3, $4^1/_2$ or 6	Major Group	6, $4^1/_2$ or 3
Minor, Group II, III, I	3 or 6	Minor Group	3
Minor, Group III, I, II	3 or 6	Minor Group	3
Electives	6 or 3	Electives	3, 6 or 9
Bible	1	Bible	1
Total,	16		16

DEGREES WITH DISTINCTION

Opportunity is given for students whose majors are in certain departments to win a degree with distinction. An applicant for honors must announce his candidacy at the beginning of Junior Year. In order to be eligible to such candidacy he must have secured B or higher in the courses of the Freshman and Sophomore Years. He must satisfactorily complete the additional work required by his Major Department beyond that required for his Major, and at the end of the Senior Year must pass a comprehensive examination upon the work done in the Department. He may be required also to present a thesis.

JUNIOR AND SENIOR CURRICULA IN ENGINEERING AND IN CHEMISTRY

The work of students in the technical courses in Junior and Senior years is almost entirely prescribed. The requirements are shown in detail in the tables which follow. In addition to the work of the college year students in Civil Engineering and in Chemical Engineering are required to do certain work in the summer in Sophomore and Junior years, as explained elsewhere. This work is so designed as to be of immediate practical advantage to the student, when seeking employment in his profession immediately after graduation.

RULES GOVERNING THE ELECTION OF STUDIES

1. Each student, in making his elections, must see that the courses which he desires to elect are open to his class; that he has fulfilled the prerequisites, and that the schedule of recitations is such that there will be no conflict.

2. Elections for the second term must be filed by members of the three upper classes with the Registrar on or before January 10, and for the first term on or before May 25.

3. No student is allowed to carry more than twenty credit hours or less than fifteen credit hours, without the special permission of the Committee on Attendance and Standing.

4. Any prescribed course in which a student has failed and which he must repeat shall be indicated upon his schedule card and shall take precedence over all other work.

5. No student will be allowed to enter a new course later than one week after the opening of any term except by special permission of the Committee upon Attendance and Standing.

COURSES FOR THE MASTERS' DEGREES

Students wishing to pursue advanced work in certain departments may enroll as graduate students under the conditions named on page 98. The work for graduate students will be outlined by the head of the department in which the student wishes to specialize. Special facilities will be afforded in the laboratories to those wishing to pursue definite lines of investigation.

EXHIBIT OF STUDIES

I—Leading to the Degree of **BACHELOR OF ARTS**

First Term **Freshman Year** Second Term

No. of course	Subject	Hrs. per week Class	Lab.		No. of course	Subject	Hrs. per week Class	Lab.	Cr.
Eng. 1	Composition	3		3	Eng. 2	Composition	3		3
Grk. 1 or 3	Beginners or Homer	3		3	Grk. 2 or 4	Beginners or Plato	3		3
Latin 1	Livy, etc.	3		3	Latin 2	Horace, etc.	3		3
Biol. 1	Gen. Biology } One Required	1	5	3or	History 2	Mod. European	3		3
Chem. 1	Elem. Inorg.	3	3	4	Math. 2	Solid Geom.	2		2
Math. 1	Algebra	3		3	Math. 4	Trigonometry	1		1
Phys. Trg. and Hyg.					Bible 2	Life of Christ	2		2
	Lectures and Gym.		4	1	Phys. Trg.	Gymnasium		4	1
				16 or 17					18

Sophomore Year

No. of course	Subject	Hrs. per week Class	Lab.		No. of course	Subject	Hrs. per week Class	Lab.	Cr.
Fr. 1 or 3	Elem. or Interm.	3			Fr. 2 or 4	Elem. or Advanced	3		
Ger. 1 or 3	Elem. or Interm.	3			Ger. 2 or 4	Elem. or Advanced	3		
Span.1 or 3	Elem. or Interm. } Three Required	3		9	Span.2 or 4	Elem. or Advanced	3		9
Grk. 3 or 5	Homer or Drama[1]	3			Grk. 4 or 6	Plato or Grk. Oratory[1] } Three Required	3		
Latin 3	DeOratore—Hymns	3							
Physics 1	General	2	4	4	Latin 4	De officiis—Latin Hymns	3		
Bible 3	Christ. Ch'ch I Cent.	2		2					
	Elective	3		3	Physics 2	General	2	4	4
						Elective	3		3
				18					16

Junior and Senior Years

The arrangement of the curriculum for the Junior and Senior Years is described on pages 23 and 24. The hour schedule is on pages 40 and 41.

---

[1] Required of students taking Greek 1, Freshman year.

II—Leading to the Degree of **BACHELOR OF PHILOSOPHY**

First term **Freshman Year** Second Term

No. of course	Subject	Hrs. per week Class	Lab.	Cr.	No. of course	Subject	Hrs. per week Class	Lab.	Cr.
Eng. 1	Composition	3		3	Eng. 2	Composition	3		3
Fr. 1 or 3	Elem. or Interm. } [1] One Re-quired	3			Fr. 2 or 4	Elem. or Adv. } [1] One Required	3		
Ger. 1 or 3	Elem. or Interm.	3		3	Ger. 2 or 4	Elem. or Adv.	3		3
Sp. 1 or 3	Elem. or Interm.	3			Sp. 2 or 4	Elem. or Adv.	3		
Latin 1	Livy, Horace, *Odes*	3		3	Latin 2	Horace, *Epodes*, Lat., etc.	3		3
Biol. 1	General Biol. } One Required	1	5	3or	Hist. 2	Modern European	3		3
Chem. 1	Elem. Inorg.	3	3	4	Math. 2	Solid Geometry	2		2
Math. 1	Algebra	3		3	Math. 4	Trigonometry	1		1
Phys. Trg.					Bible 2	Life of Christ	2		2
and Hyg.	Health Lect.—Gym.		4	1	Phys. Trg.	Gymnasium		4	1
				16 or 17					18

Sophomore Year

No. of course	Subject	Class	Lab.	Cr.	No. of course	Subject	Class	Lab.	Cr.
Fr. 1 or 3	Elem. or Interm. } [1] One Re-quired	3			Fr. 2 or 4	Elem. or Adv. } [1] One Required	3		
Ger. 1 or 3	Elem. or Interm.	3		3	Ger. 2 or 4	Elem. or Adv.	3		3
Sp. 1 or 3	Elem. or Interm.	3			Sp. 2 or 4	Elem. or Adv.	3		
Latin 3	De Oratore Latin Hymns	3		3	Latin 4	Lat. Hymns—De officiis	3		3
Physics 1	General	2	4	4	Physics 2	General	2	4	4
Bible 3	Christ. Ch'ch I Cent.	2		2		Electives (2)	6		6
	Electives (2)	6		6					16
				18					

Junior and Senior Years

The arrangement of the curriculum for the Junior and Senior years is described on pages 23 and 24. The hour schedule is on pages 40 and 41.

---

[1] A minimum of two modern languages amounting to a total of four years' work, including entrance credits, is required by the end of the Sophomore year.

III—LEADING TO THE DEGREE OF **BACHELOR OF SCIENCE**

First Term **Freshman Year** Second Term

No. of course	Subject	Hrs. per week			No. of course	Subject	Hrs. per week		
		Class	Lab.	Cr.			Class	Lab.	Cr.
Eng. 1	Composition	3		3	Eng. 2	Composition [1]	3		3
Fr. 1 or 3	Elem. or Interm. } [1] One Required	3			Fr. 2 or 4	Elem. or Adv. } One Required	3		
Ger. 1 or 3	Elem. or Interm.	3		3	Ger. 2 or 4	Elem. or Adv.	3		3
Sp. 1 or 3	Elem. or Interm.	3			Sp. 2 or 4	Elem. or Adv.	3	3	
Biol. 1	General } One Required	1	5	3or	Graph. 2	Dw'g, Sketch, Isomet.		6	2
Chem. 1	Elem. Inorg.	3	3	4	Math. 2, 4	Solid Geometry, } One Required			
Graph. 1	Dw'g, Lettering, Proj.		6	2		Trig.	3		3
Math. 1	Algebra } One Required	3		3	Math. 6	Trignometry	3		
Math. 3, 5	Algebra-Trig.	3			Hist. 2	Modern European } One Required	3		
Fr. 1, 3	Elem. or Interm. } One Required	3			Biol. 4	Vertebrate Zoölogy	1	5	3or
Ger. 1, 3	Elem. or Interm.	3		3or	Chem. 2	Inorg. and Qual.			4
Sp. 1, 3	Elem. or Interm.	3	3	4		Anal.	3	3	
Biol. 1	General	1	5		Fr. 4	Advanced } One Requird	3		
Chem. 1	Elem. Inorg.	3	3		Ger. 4	Advanced	3		
Phys. Trg.					Sp. 4	Advanced	3		
and Hyg.	Health Lect.—Gym.		4	1	Biol. 4	Vertebrate Zoöl.			3or
					Chem. 2	Inorg. and Qual.	1	5	4
				—		Anal.	3	3	
				18	Bible 2	Life of Christ	2		2
				or	Phys. Trg.	Gymnasium		4	1
				19					—
									20
									or
									21

Sophomore Year

No. of course	Subject	Class	Lab.	Cr.	No. of course	Subject	Class	Lab.	Cr.
Fr. 3 or 21	Interm. or Fr. Hist. } One Required	3			Fr. 4 or 22	Adv. or French } One Required			
Ger. 3 or 11	Inter. or XIX Cent.			3		Novel	3		
	Writers	3			Ger. 4 or 12	Adv. or XIX			3
Sp. 1 or 3	Elem. or Interm.	3				Cent. Writers	3		
Math. 7	Trigonometry	3		3	Sp. 2 or 4	Elem. or Adv.	3		
Physics 1	General	2	4	4	Math. 10	Analytics	3		3
Bible 3	Christ. Ch'ch I Cent.	2		2	Physics 2	General	2	4	4
	Electives (2)	6		6		Electives (2)	6		6
				18					—
									16

Junior and Senior Years

The arrangements of the curriculum for the Junior and Senior Years is described on pages 23 and 24. The hour schedule is on pages 40 and 41.

---

[1] A minimum of two years of each of two modern languages, including entrance credits, is required by the end of the Sophomore year.

V—PRE-MEDICAL COURSE

First Term **Freshman Year** Second Term

No. of course	Subject	Hrs. per week Class	Lab.	Cr.	No. of course	Subject	Hrs. per week Class	Lab.	Cr.
Eng. 1	Composition	3		3	Eng. 2	Composition	3		3
Fr. 1 or 3	Elem. or Interm. } [1]One re-	3		3	Fr. 2 or 4	Elem. or Adv. } One re-	3		3
Ger. 1 or 3	Elem. or Interm. } quired	3			Ger. 2 or 4	Elem. or Adv. } quired	3		
Biol. 1	General	1	5	3	Biol. 4	Vertebrate Zoölogy	1	5	3
Chem. 1	Elem. Inorg.	3	3	4	Chem. 2	Inorg. and Qual. Anal.	3	3	4
Math. 1	Algebra	3		3	Math. 2, 4	Solid Geometry, Trig.	3		3
	Elective	3		3	Bible 2	Life of Christ	2		2
Phys. Trg.					Phys. Trg.	Gymnasium		4	1
and Hyg.	Health Lect.—Gym.		4	1					—
				—					19
				20					

Sophomore Year

No. of course	Subject	Class	Lab.	Cr.	No. of course	Subject	Class	Lab.	Cr.
Biol. 3	Botany	1	5	3	Biol. 2	Bacteriology	1	5	3
Biol. 5 or 7	Physiol. or Invert. Zoöl.	1	5	3	Biol. 6	Embryology	1	5	3
Chem. 3	Advanced Qualitative	1	2	2	Chem. 4	Advanced Qualitative	1	2	2
Chem. 5	Organic	2	3	3	Chem. 6	Organic	2	3	3
Physics 1	General	2	4	4	Physics 2	General	2	4	4
Bible 3	Christ. Ch'ch I Cent.	2		2		Electives (2)	6		6
	Elective	3		3					—
				—					21
				20					

---

[1] French 1 or 3 may be elected only if two or more units of German are accepted as entrance credits.

V—LEADING TO THE DEGREE OF BACHELOR OF SCIENCE IN CHEMISTRY

First Term **Freshman Year** Second Term

No. of course	Subject	Hrs. per week			No. of course	Subject	Hrs. per week		
		Class	Lab.	Cr.			Class	Lab.	Cr.
Eng. 1	Composition	3		3	Eng. 2	Composition	3		3
Ger. 1 or 3	Elem. or Interm.	3		3	Ger. 2 or 4	Elem. or Advanced	3		3
Chem. 1	Elem. & Inorg.	3	3	4	Chem. 2	Inorg. & Qual. Anal.	3	3	4
Graph. 1	Drw'g, Lettering, Proj.		6	2	Graph. 2	Drw'g, Sketch, Isometric		6	2
Math. 3	Algebra	4		4	Math. 6	Analytic Geom.	3		3
Math. 5	Trigonometry	2		2	Math. 8	Laboratory Math.		2	1
					C.E. 2	Plane Surveying		6	2
Phys. Trg. and Hyg.	Health Lect.—Gym.		4	1	Phys. Trg.	Gymnasium		4	1
					Bible 4	Life of Christ	2		2
				19					21
					Sophomore Year				
Eng. 3	English Literature } One required	3		3	Eng. 4	English Literature } One required	3		
Sp. 1 or 3	Elem. or Interm. }	3			Sp. 2 or 4	Elem. or Advanced }	3		3
Chem. 3	Advanced Qual. Anal.	1	2	2	Chem. 4	Advanced Qual. Anal.	1	2	2
Chem. 5	Organic Chemistry	2	3	3	Chem. 6	Organic Chemistry	2	3	3
Math. 11	Differential Calculus	3		3	Math. 12	Differential Calculus	4		4
Phys. 3	General Physics	2	6	4	Phys. 4	General Physics	2	6	4
M.E. 1	Pattern Making		4	2	M.E. 2	Forging		4	2
Bible 5	Christ. Ch'ch I Cent.	2		2					
				19					18
					Junior Year				
Biol. 9	Sanitary Biology	1	5	3	Chem. 8	Quant. Analysis	2	10	6
Chem. 7	Quantitative Anal.	1	6	3	Chem. 10	Physical Chemistry	2		2
Chem. 9	Physical Chemistry	2		2	Chem. 12	Stoichiometry	1		1
Chem. 11	Stoichiometry	1		1	Chem. 14	Metallurgy	2	3	3
Chem. 13	Metallurgy	2	3	3	Chem. 18	Advanced Organic	3		3
Chem. 17	Advanced Organic	3		3	Chem. 26	Chemical German	1		1
Chem. 25	Chemical German	1		1	Geol. 8	General Geology	2		2
Geol. 7	General Geology	2		2	Bible 8	Hist. Jewish People	2		2
				18					20
					Senior Year				
Chem. 19	Chem. Engineering	3		3	Hist. 4	American Political } One required	3		
Chem. 21	Quantitative Analysis	2	16	8	Phil. 2	Logic }	3		3
Chem. 27	Chemical German	1		1	Soc. 2	Social Reform }	3		
Geol. 9	Ore Deposits	2		2	Chem. 20	Chemical Technology	3		3
Geol. 11	Systematic Mineralogy	1	3	2	Chem. 22	Thesis	1	15	6
Bible 9	Teachings of the Prophets	2		2	Chem. 28	Chemical German	1		1
					Geol. 10	Ore Deposits	2		2
				18	Geol. 12	Petrography	2		2
					M.E. 14	Industrial Management	2		2
									19

IV—LEADING TO THE DEGREE OF BACHELOR OF SCIENCE IN CHEMICAL ENGINEERING

First Term **Freshman Year** Second Term

No. of course	Subject	Hrs. per week			No. of course	Subject	Hrs. per week		
		Class	Lab.	Cr.			Class	Lab.	Cr.
Eng. 1	Composition	3		3	Eng. 2	Composition	3		3
Fr. 1 or 3	Elem. or Interm. } One required	3			Fr. 2 or 4	Elem. or Adv. } One required	3		
Ger. 1 or 3	Elem. or Interm.	3		3	Ger. 2 or 4	Elem. or Adv.	3		3
Sp. 1 or 3	Elem. or Interm.	3			Sp. 2 or 4	Elem. or Adv.	3		
Chem. 1	Elementary and Inorg.	3	3	4	Chem. 2	Inorg. and Qual. Anal.	3	3	4
Graph. 1	Dw'g, Lettering, Proj.		6	2	Graph. 2	Dw'g, Sketch, Isometric		6	2
Math. 3	Algebra	4		4	Math. 6	Analytic Geom.	3		3
Math. 5	Trigonometry	2		2	Math. 8	Laboratory Math.		2	1
Phys. Trg.					C.E. 2	Plane Surveying		6	2
and Hyg.	Health Lec., Gym.		4	1	Bible 4	Life of Christ	2		2
				—	Phys. Trg.	Gymnasium		4	1
				19					—
									21
	Sophomore Year								
Eng. 3	English Literature } One required	3		3	Eng. 4	English Literature } One required	3		3
Sp. 1 or 3	Elem. or Interm.	3			Sp. 2 or 4	Elem. or Interm.	3		
Chem. 3	Advanced Qual. Anal.	1	2	3	Chem. 4	Advanced Qual. Anal.	1	2	2
Graph. 3	Descriptive Geometry	3		3	Graph. 4	Des. Geom. Mach. Dw'g	1	4	3
Math. 11	Differential Calculus	3		3	Math. 12	Integral Calculus	4		4
Phys. 3	General Physics	2	6	4	Phys. 4	General Physics	2	6	4
M.E. 1	Pattern Making		4	2	C.E. 6½	Applied Mechanics	2		2
Bible 5	Christ. Ch'ch I Cent.	2		2	M.E. 2	Forging		4	2
				—					—
				20					20
	Junior Year								
Chem. 7	Quantitative Analysis	1	6	3	Chem. 8	Quantitative Analysis	1	6	3
Chem. 9	Physical Chemistry	2		2	Chem. 10	Physical Chemistry	2		2
Chem. 11	Stoichiometry	1		1	Chem. 12	Stoichiometry	1		1
Chem. 13	Metallurgy	2	3	3	Chem. 14	Metallurgy	2	3	3
C.E. 7	Applied Mechanics	3		3	C.E. 10	Mechanics of Materials	3		3
C.E. 9	Mechanics of Materials	3		3	C.E. 30	General Testing Lab.		3	1
C.E. 29	General Testing Lab.		3	1	E.E. 6	Motor & Illum. Eng.	1	3	2
E.E. 5	Elements Electric Eng.	2		2	M.E. 10	Heat Engineering	3		3
M.E. 9	Heat Engineering	3		3	Bible 8	Hist. of Jewish People	2		2
				—					—
				21					20
	Senior Year								
Econ. 3	Business Corporations	2		2	Econ. 4	Money and Banking } One required	3		3
Biol. 9	Sanitary Biology	1	5	3	Hist. 4	American Political	3		
Chem. 19	Chemical Engineering	3		3	Law 10	Business Law	3		3
Chem. 21	Quantitative Analysis	1	6	4	Chem. 20	Chemical Technology	3		3
Geol. 9	Ore Deposits	2		2	Chem. 22	Thesis	1	6	4
Geol. 11	Systematic Mineralogy	1	3	2	Geol. 10	Ore Deposits	2		2
C.E. 11	Cement and Concrete	2		2	Geol. 12	Petrography	2		2
C.E. 23	Hydraulics	2		2	C.E. 24	Hydraulics	2		2
C.E. 31	Cement and Concrete Lab.		3	1	M.E. 14	Industrial Management	2		2
Bible 9	Teachings of the Prophets	2		2					—
				—					21
				23					

LEADING TO THE DEGREE OF BACHELOR OF SCIENCE IN CIVIL ENGINEERING

Freshman Year

First Term					Second Term				
No. of course	Subject	Hrs. per week Class	Lab.	Cr.	No. of course	Subject	Hrs. per week Class	Lab.	Cr.
Eng. 1	Composition	3		3	Eng. 2	Composition	3		3
Fr. 1 or 3	Elem. or Interm. One required	3		3	Fr. 2 or 4	Elem. or Interm. One required	3		3
Ger. 1 or 3	Elem. or Interm.	3			Ger. 2 or 4	Elem. or Interm.	3		
Sp. 1 or 3	Elem. or Interm.	3			Sp. 2 or 4	Elem. or Interm.	3		
Chem. 1	Elem. and Inorg.	3	3	4	Chem. 2	Inorg. & Qual. Anal.	3	3	4
Graph. 1	Dw'g, Lettering, Proj.		6	2	Graph. 2	Dw'g, Sketch., Isometric		6	2
Math. 3	Algebra	4		4	Math. 6	Analytic Geometry	3		3
Math. 5	Trigonometry	2		2	Math. 8	Laboratory Mathematics		2	1
Phys. Trg.					C.E. 2	Plane Surveying		6	2
and Hyg.	Health Lect.—Gym.		4	1	Bible 4	Life of Christ	2		2
				—	Phys. Trg.	Gymnasium		4	1
				19					—
									21

C.E. 2*a* Summer School in Surveying. 3 weeks in vacation, 2½ Cr.

Sophomore Year

Eng. 3	English Literature One required	3		3	Eng. 4	English Literature One required	3		3
Sp. 1 or 3	Elem. or Interm.	3			Sp. 2 or 4	Elem. or Interm.	3		
Graph. 3	Descriptive Geometry	3		3	Graph. 4	Des. Geom.—Mach. Dw'g	1	4	3
Math. 11	Differential Calculus	3		3	Math. 12	Integral Calculus	4		4
Phys. 3	General Physics	2	6	4	Phys. 4	General Physics	2	6	4
C.E. 3	Topographic Surveying	1	3	2	C.E. 4	Railroads	1	3	2
M.E. 1	Pattern Making		4	2	C.E. 6½	Applied Mechanics	2		2
Bible 5	Christ. Ch'ch I Cent.	2		2	M.E. 2	Forging		4	2
				—					—
				19					20

C.E. 4*a* Summer School. Railroads 3 weeks in vacation, 2½ Credits.

Junior Year

Geol. 7	General Geology		4	2	Biol. 10	Sanitary Biology	1	4	3
C.E. 5	Railroads	1	4	3	Geol. 8	General Geology	2		2
C.E. 7	Applied Mechanics	3		3	C.E. 6	Geodesy	1	3	2
C.E. 9	Mechanics of Materials	3		3	C.E. 8	Roads and Pavements	2		2
C.E. 11	Cement and Concrete	2		2	C.E. 10	Mechanics of Materials	3		3
C.E. 29	General Testing Lab.		3	1	C.E. 12	Masonry	2		2
C.E. 31	Cement and Concrete Lab.		3	1	C.E. 14	Framed Structures	2		2
E.E. 5	Elements of Elec. Eng.	2		2	C.E. 20	Hydraulics	2		2
E.E. 9	Electrical Lab.		3	1	C.E. 30	Gen. Testing Lab.		3	1
				—	Bible 8	Hist. Jewish People	2		2
				18					—
									21

Senior Year

Econ. 3	Business Corporations	2		2	Econ. 4	Money and Banking One required	3		3
C.E. 13	Masonry Design		6	2	Hist. 8	Renaissance	3		
C.E. 15	Framed Structures	3	6	6	Phil. 10	Educational Psychol.	3		
C.E. 17	Sewerage	2		2	Law 10	Business Law	3		3
C.E. 21	Hydraulics	2		2	C.E. 16	Framed Structures	3	12	9
C.E. 25	Water Supply	2		2	C.E. 18	Sewerage Design		6	2
C.E. 27	Reinforced Concrete	2		2	C.E. 26	Water Supply Design		3	1
Bible 9	Teaching of the Prophets	2		2	C.E. 36	Thesis		3	1
				—					—
				20					19

LEADING TO THE DEGREE OF **BACHELOR OF SCIENCE** IN **ELECTRICAL ENGINEERING**

Freshman Year

First Term					Second Term				
No. of course	Subject	Hrs. per week			No. of course	Subject	Hrs. per week		
		Class	Lab.	Cr.			Class	Lab.	Cr.
Eng. 1	Composition	3		3					
Fr. 1 or 3	Elem. or Interm. One required	3			Eng. 2	Composition	3		3
Ger. 1 or 3	Elem. or Interm.	3		3	Fr. 2 or 4	Elem. or Interm. One required	3		
Sp. 1 or 3	Elem. or Interm.	3			Ger. 2 or 4	Elem. or Interm.	3		3
Chem. 1	Elem. and Inorg.	3	3	4	Sp. 2 or 4	Elem. or Interm.	3		
Graph. 1	Dw'g. Lettering, Proj.		6	2	Chem. 2	Inorg. and Qual. Anal.	3	3	4
Math. 3	Algebra	4		4	Graph. 2	Drawing, Sketch, Isometric		6	2
Math. 5	Trigonometry	2		2	Math. 6	Analytic Geometry	3		3
					Math. 8	Laboratory Mathematics		2	1
Phys. Trg. and Hyg.	Health Lec., Gym.		4	1	C.E. 2	Plane Surveying		6	2
				—	Bible 4	Life of Christ	2		2
				19	Phys. Trg.	Gymnasium		4	1
									—
									21

Sophomore Year

No. of course	Subject	Class	Lab.	Cr.	No. of course	Subject	Class	Lab.	Cr.
					Eng. 4	English Literature One required	3		3
Eng. 3	English Literature One required	3		3	Sp. 2 or 4	Elem. or Interm.	3		
Sp. 1 or 3	Elem. or Interm.	3			Graph. 4	Des. Geom. Mach. Dw'g	1	4	3
Chem. 3	Advanced Qual. Anal.	1	2	2	Math. 12	Integral Calculus	4		4
Graph. 3	Descriptive Geometry	3		3	Phys. 4	General Physics	2	6	4
Math. 11	Differential Calculus	3		3	Phys. 6	Electricity		4	2
Phys. 3	General Physics	2	6	4	C.E. 6½	Applied Mechanics	2		2
M.E. 1	Pattern Making		6	2	M.E. 2	Forging		6	2
Bible 5	Christ. Ch'ch I Cent.	2		2					—
				—					20
				19					

Junior Year

No. of course	Subject	Class	Lab.	Cr.	No. of course	Subject	Class	Lab.	Cr.
C.E. 7	Applied Mechanics	3		3					
C.E. 9	Mechanics of Materials	3		3	C.E. 10	Mechanics of Materials	3		3
C.E. 29	General Testing Lab.		3	1	C.E. 30	General Testing Lab.		3	1
E.E. 1	Direct & Alt. Currents	5		5	E.E. 2	Direct & Alt. Currents	5		5
E.E. 3	Electrical Lab.		6	2	E.E. 4	Electrical Lab.		6	2
E.E. 21	Engineering Abstracts		2	1	E.E. 6	Motor and Illum. Eng.	3		3
M.E. 9	Heat Engineering	3		3	E.E. 22	Engineering Abstracts		2	1
				—	M.E. 10	Heat Engineering	3		3
				18	Bible 8	Hist. Jewish People	2		2
									—
									20

Senior Year

No. of course	Subject	Class	Lab.	Cr.	No. of course	Subject	Class	Lab.	Cr.
Econ. 3	Business Corporations	2		2	Econ. 4	Money and Banking	3		3
C.E. 23	Hydraulics	2		2	Law 10	Business Law	3		3
E.E. 7	Electrical Lab.		6	2	E.E. 8	Electrical Lab.		6	2
E.E. 11a	Electrical Power Trans.	5		5	E.E. 16a	Elec. Power Plant Eng.	5		5
E.E. 13	Electrical Design		4	2	E.E. 22	Engineering Abstracts		2	1
E.E. 15	Electric Railway Eng.	4		4	E.E. 24	Thesis		6	2
E.E. 21	Engineering Abstracts		2	1	C.E. 24	Hydraulics	2		2
Bible 9	Teaching of the Prophets	2		2					—
				—					18
				20					

LEADING TO THE DEGREE OF BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

First Term					Second Term				
No. of course	Subject	Hrs. per week			No. of course	Subject	Hrs. per week		
		Class	Lab.	Cr.			Class	Lab.	Cr.
				Freshman Year					
Eng. 1	Composition	3		3	Eng. 2	Composition	3		3
Fr. 1 or 3	Elem. or Interm.	3			Fr. 2 or 4	Elem. or Interm.	3		
Ger. 1 or 3	Elem. or Interm. } One required	3		3	Ger. 2 or 4	Elem. or Interm. } One required	3		3
Sp. 1 or 3	Elem. or Interm.	3			Sp. 2 or 4	Elem. or Interm.	3		
Chem. 1	Elementary and Inorg.	3	3	4	Chem. 2	Inorg. and Qual. Anal.	3	3	4
Graph. 1	Dw'g, Lettering, Proj.		6	2	Graph. 2	Dw'g, Sketch, Isometric		6	2
Math. 3	Algebra	4		4	Math. 6	Analytic Geom.	3		3
Math. 5	Trigonometry	2		2	Math. 8	Laboratory Mathematics		2	1
Phys. Trg.					C.E. 2	Plane Surveying		6	2
and Hyg.	Health Lec., Gym.		4	1	Bible 4	Life of Christ	2		2
				—	Phys. Trg.	Gymnasium		4	1
				19					—
									21
				Sophomore Year					
Eng. 3	English Literature } One required	3		3	Eng. 4	English Literature } One required	3		3
Sp. 1 or 3	Elem. or Interm.	3			Sp. 2 or 4	Elem. or Interm.	3		
Chem. 3	Advanced Qual. Anal.	1	2	2	Graph. 4	Des. Geom. Mach. Dw'g	1	4	3
Graph. 3	Descriptive Geometry	3		3	Math. 12	Integral Calculus	4		4
Math. 11	Differential Calculus	3		3	Phys. 4	General Physics	2	6	4
Phys. 3	General Physics	2	6	4	Phys. 6	Electricity		4	2
M.E. 1	Pattern Making		6	2	C.E. 6½	Applied Mechanics	2		2
Bible 5	Christ. Ch'ch I Cent.	2		2	M.E. 2	Forging		4	2
				—					—
				19					20
				Junior Year					
Biol. 9	Sanitary Biology	1	5	3	Chem. 16	Metallurgy	2	3	3
C.E. 7	Applied Mechanics	3		3	C.E. 10	Mechanics of Materials	3		3
C.E. 9	Mechanics of Materials	3		3	C.E. 30	General Testing Lab.		3	1
C.E. 29	General Testing Lab.		3	1	E.E. 6	Motor and Illum. Eng.	3		3
E.E. 5	Elements of Elec. Eng.	2		2	E.E. 10	Electrical Lab.		3	1
E.E. 9	Electrical Lab.		3	1	M.E. 6	Heat Engineering	3		3
M.E. 5	Heat Engineering	3		3	M.E. 16–20	Boiler Design Mechanism	3		3
M.E. 15	Steam Boilers	3		3	Bible 8	Hist. Jewish People	2		2
				—					—
				19					19
				Senior Year					
Econ. 3	Business Corporations	2		2	Span. 4	Commercial Spanish	3		
C.E. 15*a*	Framed Structures	2		2	Econ. 4	Money and Banking } One required	3		3
C.E. 23	Hydraulics	2		2	Hist. 2	Modern European	3		
E.E. 11	Power Transmission	3		3	Law 10	Business Law	3		3
M.E. 7	Heat Engineering	3		3	C.E. 24	Hydraulics	2		2
M.E. 11	Machine Design		9	3	E.E. 16*b*	Electric Power Plant Eng.	2		2
Bible 9	Teaching of the Prophets	2		2	M.E. 8	Heat Engineering	3		3
				—	M.E. 12	Machine Design		9	3
				17	M.E. 14	Industrial Management	2		2
					M.E. 18	Thesis		6	2
									—
									20

LEADING TO THE DEGREE OF BACHELOR OF SCIENCE IN MINING ENGINEERING

First Term **Freshman Year** Second Term

No. of course	Subject	Hrs. per week			No. of course	Subject	Hrs. per week		
		Class	Lab.	Cr.			Class	Lab.	Cr.
Eng. 1	Composition	3		3	Eng. 2	Composition	3		3
Fr. 1 or 3	Elem. or Interm.	3			Fr. 2 or 4	Elem. or Adv.	3		
Ger. 1 or 3	Elem. or Interm. One required	3		3	Ger. 2. or 4	Elem. or Adv. One required	3		3
Sp. 1 or 3	Elem. or Interm.	3			Sp. 2. or 4	Elem. or Adv.	3		
Chem. 1	Elementary and Inorg.	3	3	4	Chem. 2	Inorg. and Qual. Anal.	3	3	4
Graph. 1	Dw'g, Lettering, Proj.		6	2	Graph. 2	Dw'g, Sketch, Isometric		6	2
Math. 3	Algebra	4		4	Math. 6	Analytic Geom.	3		3
Math. 5	Trigonometry	2		2	Math. 8	Laboratory Mathematics		2	1
Phys. Trg.					C.E. 2	Plane Surveying		6	2
and Hyg.	Health Lec., Gym.		4	1	Bible 4	Life of Christ	2		2
				—	Phys. Trg.	Gymnasium		4	1
				19					—
									21

C.E. 2*a* Summer School in Surveying. 3 weeks in vacation, $2^1/_2$ Cr.

Sophomore Year

Eng. 3	English Literature One required	3		3	Eng. 4	English Literature One required	3		3
Sp. 1 or 3	Elem. or Interm.	3			Sp. 2 or 4	Elem. or Interm.	3		
Chem. 3	Advanced Qual. Anal.	1	2	2	Chem. 4	Advanced Qual. Anal.	1	2	2
Graph. 3	Descriptive Geometry	3		3	Graph. 4	Des. Geom. Mach. Dw'g	1	4	3
Math. 11	Differential Calculus	3		3	Math. 12	Integral Calculus	4		4
Phys. 3	General Physics	2	6	4	Phys. 4	General Physics	2	6	4
M.E. 1	Pattern Making		4	2	C.E. $6^1/_2$	Applied Mechanics	2		2
Bible 5	Christ. Ch'ch I Cent.	2		2	M.E. 2	Forging		4	2
				—					—
				19					20

Junior Year

Chem. 13	Metallurgy	2	3	3					
Geol. 7	General Geology		4	2	Chem. 14	Metallurgy	2	3	3
C.E. 7	Applied Mechanics	3		3	Geol. 8	General Geology		4	2
C.E. 9	Mechanics of Materials	3		3	C.E. 10	Mechanics of Materials	3		3
C.E. 29	General Testing Lab.		3	1	C.E. 30	General Testing Lab.		3	1
E.E. 5	Elements of Elec. Eng.	2		2	E.E. 6	Motor & Illum. Eng.	3		3
E.E. 9	Electrical Lab.		3	1	M.E. 10	Heat Engineering	3		3
M.E. 9	Heat Engineering	3		3	E.M. 4	Ore Dressing	3		3
				—	Bible 8	Hist. of Jewish People	2		2
				18					—
									20

Senior Year

					Hist. 4	American Political	3		
Econ. 3	Business Corporations	2		2	Phil. 2	Logic One required	3		3
Chem. 23	Assaying		5	2	Soc. 2	Social Reform	3		
Geol. 9	Ore Deposits		6	2	Law 10	Business Law	3		3
Geol. 11	Ore Deposits	2		2	Geol. 10	Ore Deposits	2		2
C.E. 23	Hydraulics	2		2	Geol. 12	Petrography	2		2
E.M. 1	Mine Structures		6	2	C.E. 24	Hydraulics	2		2
E.M. 3	Mine Exploitation	2		2	E.M. 2	Mine Structures		6	2
E.M. 5	Mine Machinery	2		2	E.M. 8	Ventilation	2		2
Bible 9	Teachings of the Prophets	2		2	E.M. 14	Haulage	1		1
				—	E.M. 16	Thesis		3	1
				18					—
									18

HOUR SCHEDULE OF ARTS AND SCIENCE

HR.	Monday	Tuesday	Wednesday
8	French 1, 2 German 4 Latin 1, 2 (A.B. and Sect. A of Ph.B.) Mathematics 1, 2, 4 (Sect. B) Mathematics 3, 5, 6 (Sect. A) Spanish, 1, 2	French 1, 2 German 4 Latin 1, 2, (A.B. and Sect. A of Ph.B.) Mathematics 1, 2, 4 (Sect. B) Mathematics 3, 5, 6 (Sect. A) Spanish 1, 2	French 1, 2 German 4 Latin 1, 2 (A.B. and Sect. A of Ph.B.) Mathematics 1, 2, 4 Sect. B), 3, 5, 6 (Sect. A) Spanish 1, 2
9	English 1, 2 (A.B., B.S., M.P.) French 3, 4 German 4 Mathematics 3, 5, 6 (Sect. B)	English 1, 2 (A.B., B.S., M.P.), French 3, 4 German 4 Mathematics 3, 5, 6 (Sect. B)	English 1, 2 (A.B., B.S., M.P.), French 3, 4 German 4 Mathematics 3, 5, 6 (Sect. B)
10	Biology 1, 4 (Sect. A) Chemistry 1, 2 (B.S. in Chem.) Civ. Eng. 2 Economics 2 (elect.) French 1, 2 German 1, 2, 3, 4 (Sect. C) Government 3 (elect.) Graphics 1, 2 (B.S.) Greek 1, 2	Biology 1, 4 (Sect. A) Chemistry 1, 2 (B.S. in Chem.) Civ. Eng. 2 Economics 2 (elect.) French 1, 2 German 1, 2, 3, 4 (Sect. C) German 1, 2, 3, 4 (Sect. C) Government 3 (elect.) Graphics 1, 2, (B.S.) Greek 1, 2	Biology 1, 4 (Sect. A) Chemistry 1, 2 (B.S. in Chem.) Civ. Eng. 2 Economics 2 (elect.) French 1, 2 German 1, 2, 3, 4 (Sect. C) Government 3 (elect.) Graphics 1, 2 (B.S.) Greek 1, 2
11	Biology 1, 4 (Sect. A) Chemistry 1, 2 (B.S. in Chem.) Civ. Eng. 2 French 1 Graphics 1, 2 (B.S.) History 2, 3 Physical Training Sociology 2 (elect.) Spanish 3, 4	Biology 1, 4 (Sect. A) Chemistry 1, 2 (B.S. in Chem.) Civ. Eng. 2 French 1 Graphics 1, 2 (B.S.) History 2, 3 Physical Training Sociology 2 (elective) Spanish 3, 4	Biology 1, 4 (Sect. A) Chemistry 1, 2 (B.S. in Chem.) Civ. Eng. 2 French 1 Graphics 1, 2 (B.S.) History 2, 3 Sociology 2 (elect.) Spanish 3, 4
1	Biology 1, 4 (Sect. B) English 1, 2 (Ph.B.) Graphics 1, 2 (B.S. in Chem.)	Biology 1, 4 (Sect. B) English 1, 2 (Ph.B.) Graphics 1, 2 (B.S. in Chem.)	Public lectures and student organization meetings
2	Biology 1, 4 (Sect. B) Graphics 1, 2 (B.S. in Chem.) Greek 3, 4 Latin 1, 2 (Sect. B of Ph.B.)	Biology 1, 4 (Sect. B) Graphics 1, 2 (B.S. in Chem.) Greek 3, 4 Latin 1, 2 (Sect. B of Ph.B)	
3	Biology 1, 4 (Sect. B) Graphics 1, 2 (B.S. in Chem.)	Biology 1, 4 (Sect. B) Graphics 1, 2 (B.S. in Chem.)	
4	Physical Training	Physical Training	

COURSES, FRESHMAN YEAR

Thursday	Friday	Saturday
French 3, 4 German 1, 2, 3, 4 (Section A) Mathematics 1, 2, 4 (Sect. A) Spanish 1, 2	French 3, 4 German 1, 2, 3, 4 (Section A) Mathematics 1, 2, 4 (Sect. A) Spanish 1, 2	French 3, 4 German 1, 2, 3, 4 (Section A) Mathematics 1, 2, 4 (Sect. A) Spanish 1, 2
French 1, 2 German 11, 12 Government 2 (elect.) Greek 1, 2	French 1, 2 German 11, 12 Government 2 (elect.) Greek 1, 2	French 1, 2 German 11, 12 Government 2 (elect.) Greek 1, 2
Chemistry 1, 2 German 3, 4 History 4, 5 (elective) Mathematics 3, 5 (Sect. A) Mathematics 8 (Sect. A) Spanish 1, 2	Chemistry 1, 2 German 3, 4 History 4, 5 (elective) Mathematics 3, 5 (Sect. A) Mathematics 8 (Sect. A) Spanish 1, 2	Chemistry 1, 2 German 3, 4 History 4, 5 (elective) Mathematics 3, 5 (Sect. A) Mathematics 8 (Sect. B) Spanish 1, 2
Bible 2 (A.B. Ph.B.) Chemistry 1, 2 (Lect. Chem.—Lab. Arts and Sci.) German 3 History 2 Mathematics 3, 5 (Sect. B) Physical Training Sociology, 1, 2 (elective) Spanish 1	Bible 2 (A.B. Ph.B.) Chemistry 1, 2 (Lect. Chem.—Lab. Arts and Sci.) German 3 History 2 Mathematics 3, 5 (Sect. B) Physical Training Sociology 1, 2 (elective) Spanish 1	Chemistry 1, 2 German 3 History 2 Mathematics 3, 5 (Sect. B) Mathematics 8 (Sect. B) Sociology 1, 2 (elective) Spanish 1
Bible 2 (B.S. M.P.) English 1, 2 (Ph.B.)	Bible 2 (B.S. M.P.)	
Chemistry 1, 2 (B.S. in Chem.) Greek 3, 4 Latin 1, 2 (Sect. B of Ph.B.)	Chemistry 1, 2 (B.S. in Chem.) Greek 3, 4	
Chemistry 1, 2 (B.S. in Chem.)	Chemistry 1, 2 (B.S. in Chem.)	
Physical Training	Physical Training	

SCHEDULE OF ARTS AND SCIENCE

HR.	Monday	Tuesday	Wednesday
8	Bible 3 (Sect. A) French 1, 2 German 4 Mech. Eng. 3, 4 Spanish 1, 2	Bible 4 (Sec. A) French 1, 2 German 4 Mech. Eng. 3, 4 Spanish 1, 2	French 1, 2 German 4 Physics 1, 2 (Lab. B.S., M.P.) Physics 3, 4 (Lecture) Spanish 1, 2
9	French 3, 4 German 4 Mech. Eng. 3, 4 Physics 1, 2 (Lecture)	French 3, 4 German 4 Mech. Eng. 3, 4 Physics 1, 2 (Lecture)	French 3, 4 German 4 Physics 1, 2 (Lab. B.S., M.P.) Physics 3, 4 (Quiz)
10	Economics 2 (elect.) French 1, 2 German 1, 2, 3, 4 (Sect. C) Government 3 (elect.) Greek 1, 2 Mathematics 11	Economics 2 (elective) French 1, 2, German 1, 2, 3, 4 (Sect. C) Government 3 (elect.) Greek 1, 2 Mathematics 11	Economics 2 (elective) French 1, 2 German 1, 2, 3, 4 (Sect. C) Government 3 (elect.) Greek 1, 2 Mathematics 11, 12
11	Chemistry 5, 6 (B.S. in Chem.) French 1 History 3 (elect.) Mathematics 7, 10 Sociology 2 (elective) Spanish 3, 4	Chemistry 5, 6 (B.S. in Chem.) French 1 History 3 (elect.) Mathematics 7, 10 Sociology 2 (elective) Spanish 3, 4	French 1 History 3 (elect.) Mathematics 7, 10 Sociology 2 (elective) Spanish, 3, 4
1	Bible 3 (Sec. B) Biology 2, 3	Bible 3 (Sec. B.) Biology 2, 3 Greek 5, 6 (elective)	Public lectures and student organization meetings
2	Biology 2, 3 Physics 1, 2 (Lab. A.B., Ph.B., Sect. B) 3, 4 (Lab.)	Biology 2, 3 Greek 3, 4 Physics 1, 2 (Lab. A.B., Ph.B., Sect. B) 3, 4 (Lab.)	
3	Biology 2, 3 Physics 1, 2 (Lab. A.B., Ph.B., Sect. B) 3, 4 (Lab.)	Biology 2, 3 Physics 1, 2 (Lab. A.B., Ph.B., Sect. B) 3, 4 (Lab.)	

COURSES SOPHOMORE YEAR

Thursday	Friday	Saturday
French, 3, 4 German 1, 2, 3, 4 Physics 1, 2 (Lab. B.S., M. P.), 3, 4 (Lect.) Spanish 1, 2	Chemistry 3, 4 French 3, 4 German 1, 2, 3, 4 Physics 1, 2 (Lab. A.B., Ph.B.. Sect. A) Spanish 1, 2	Chemistry 3, 4 French 3, 4 German 1, 2, 3, 4 Physics 1, 2 (Lab.. A.B., Ph.B., Sect. A) Spanish 1, 2
French 1, 2 German 11, 12 Government 2 (elective) Greek, 1, 2 Physics 1, 2 (Lab. B.S., M.P.), 3, 4 (Quiz)	Chemistry 3, 4 French 1, 2 German 11, 12 Government 2 (elective) Greek 1, 2 Physics 1, 2 (Lab. A.B., Ph.B., Sect. A)	Chemistry 3, 4 French 1, 2 German 11, 12 Government 2 (elective) Greek 1, 2 Physics 1, 2 (Lab. A.B., Ph.B., Sect. A)
Chemistry 5, 6 English 3, 5, 6 (elective) German, 3, 4 History 4, 5 (elective) Mathematics 12 Spanish 1, 2	Chemistry 5, 6 English 3, 5, 6 (elective) German 3, 4 History 4, 5 (elective) Spanish 1, 2	Chemistry 5, 6 English 3, 5, 6 (elective) German 3, 4 History 4, 5 (elective) Spanish 1, 2
Chemistry 5, 6 German 3 History 2 (elective) Latin 3, 4 Sociology 1, 2 (elective) Spanish 1	Chemistry 5, 6 German 3 History 2 (elective) Latin 3, 4 Sociology 1, 2 (elective) Spanish 1	Chemistry 5, 6 German 3 History 2 (elective) Latin 3, 4 Sociology 1, 2 (elective) Spanish 1
Biology 5, 6 Chemistry 5, 6 Greek 5, 6 (elective)	Biology 5, 6 Chemistry 3, 4 Greek 5, 6 (elective)	
Biology 5, 6 Chemistry 5, 6 Greek 3, 4 Physics 1, 2 (Lab. A.B., Ph.B., Sect. C)	Biology 5, 6 Chemistry 3, 4 Greek 3, 4 Physics 1, 2 (Lab. A.B., Ph.B., Sect. C)	
Biology 5, 6 Chemistry 5, 6 Physics 1, 2 (Lab. A.B., Ph.B., Sect. C)	Biology 5, 6 Chemistry 3, 4 Physics 1, 2 (Lab. A.B., Ph.B., Sect. C)	

SCHEDULE OF ARTS AND SCIENCE

HR.	Monday	Tuesday	Wednesday
8	Chemistry 17, 18, 21, 22 English 13, 14 Geology 11, 12 German 21, 22, 23 Greek 7, 8 History 7, 8, 9, 10 Spanish 1, 2	Chemistry 15, 16, 21, 22 English 13, 14 Geology 11, 12 German 21, 23, 23 Greek 7, 8 History 7, 8, 9, 10 Spanish 1, 2	Chemistry 17, 18, 19, 20 English 13, 14 German 21, 22, 23 Greek 7, 8 History 7, 8, 9, 10 Spanish 1, 2
9	Chemistry 21, 22 Economics 4, 5 English 7, 8 French 23, 24 Geology 1, 2 Philosophy 9, 10	Chemistry 21, 22 Economics 4, 5 English 7, 8 French 23, 24 Geology 1, 2 Philosophy 9, 10	Chemistry 8, 21, 22 Economics 4 English 7, 8 French 23, 24 Geology 1, 2 Philosophy 9, 10
10	Biology 1, 4 Chemistry 9, 10, 21, 22 Economics 2 Geology 7, 8 Government 3 Latin 7, 8 Physics 9, 18	Biology 1, 4 Chemistry, 9, 10, 21, 22 Economics 2 Geology 7, 8 Government 3 Latin 7, 8 Physics 9, 18,	Biology 1, 4 Chemistry 8, 21, 22 Economics 2 Government 3 Latin 7, 8 Physics 9, 18
11	Biology 1, 4 Chemistry 21, 22 English 17, 18 or 23, 24 Geology 7, 8 German 8 Greek 13, 14 History 3, 11 Mathematics 7, 10 Spanish 3, 4	Biology 1, 4 Chemistry 21, 22 English 17, 18 or 23, 24 Geology 7, 8 German 8 Greek 13, 14 History 3, 11 Mathematics 7, 10 Physics 9, 18, 20 Spanish 3, 4	Biology 1, 4 Chemistry 8, 21, 22 English 17, 18 or 23, 24 German 8 Greek 13, 14 History 3, 11 Mathematics 7, 10 Physics 9, 18, 20 Spanish 3, 4
1	Bible 6, 7, 10 Biology 1, 2, 3, 4 Chemistry 13, 14, 22 Geology 11	Biology 1, 2, 3, 4 Chemistry 13, 14 Education 11, 12 English 20 Geology 11 Greek 5, 6 Latin 10 Mathematics 17, 18	Public lectures and student organization meetings
2	Biology 1, 2, 3, 4 Chemistry 13, 14, 22 Geology 11 Physics 11, 12	Biology 1, 2, 3, 4 Chemistry 13, 14 Geology 11 Government 4, 5 Latin 12 Mathematics 15, 16 Philosophy 4, 5, 6, 8 Physics 11, 12	Bible 6, 7, 10
3	Biology 1, 2, 3, 4 Chemistry 13, 14, 22 Geology 11 Greek 9, 10 Physics 11, 12	Biology 1, 2, 3, 4 Chemistry 13, 14 Geology 11 Greek 9, 10 Physics 11, 12	

COURSES, JUNIOR AND SENIOR YEARS

Thursday	Friday	Saturday
Chemistry 19, 20 English 9, 12 Geology 5, 6 Law 9, 10 Philosophy 1, 2 Spanish 1, 2	Chemistry 8, 19, 20 English 9, 12 Geology 5, 6 Law 9, 10 Philosophy 1, 2 Spanish 1, 2	Chemistry 8 English 9, 12 Geology 5, 6, 9 Law 9, 10 Philosophy, 1, 2 Spanish, 1, 2
Chemistry 11, 12, 21 English 25, 26 Geology 5, 6 German 11, 12 Government 1, 2 Latin 5, 6 Mathematics 13, 14 Philosophy 3	Chemistry 25, 26, 27 Chemistry 16 (Mech.) English 25, 26 Geology 5, 6 German 11, 12 Government 1, 2 Latin 5, 6 Mathematics 13, 14 Philosophy 3	Chemistry 7, 8, 28 Chemistry 16 (Mech.) English 25, 26 Geology 5, 6, 9 German 11, 12 Government 1, 2 Latin 5, 6 Mathematics 13, 14 Philosophy 3
Biology 7, 8 Chemistry 21 English 5, 6 French 21, 22 Geology 3, 4 German 13, 14, 15, 16 Greek 11, 12 History 4, 5 Philosophy 1, 2 Physics, 7, 8 Spanish 1, 2	Biology 7, 8 Chemistry 16 (Mech.) English 5, 6 French 21, 22 Geology 3, 4 German 13, 14, 15, 16 Greek 11, 12 History 4, 5 Philosophy 1, 2 Physics 7, 8 Spanish 1, 2	Biology 7, 8 Chemistry 16 (Mech.) English 5, 6 French 21, 22 Geology 3, 4 German 13, 14, 15, 16 Greek 11, 12 History 4, 5 Philosophy 1, 2 Physics 7, 8 Spanish 1, 2
Biology 7, 8 Chemistry 21 English 15, 16 or 21, 22 Geology 3, 4 Greek 15 History 2 Italian 1, 2 Philosophy 3 Sociology 1, 2 Spanish 1	Biology 7, 8 Chemistry 16 (Mech.) English 15, 16 or 21, 22 Geology 3, 4 Greek 15 History 2 Italian 1, 2 Philosophy 3 Physics 7, 8 Sociology 1, 2 Spanish 1	Biology 7, 8 Chemistry 16 (Mech,) English 15, 16 or 21, 22 Geology 3, 4 Greek 15 History 2 Italian 1, 2 Philosophy 3 Physics 7, 8 Sociology 1, 2 Spanish 1
Biology 5, 6 Chemistry 7, 8, 21, 22 Education 11, 12 English 20 Geology 12 Greek 5, 6 Latin 10 Mathematics 17, 18	Biology 5, 6 Chemistry, 7, 8, 21, 22 Education 11, 12 English 20 Geology 9, 12 Greek 5, 6 Latin 10 Mathematics 17, 18	
Biology 5, 6 Chemistry 7, 8, 21, 22 Geology 12 Government 4, 5 Latin 12 Mathematics 15, 16 Philosophy 4, 5, 6, 8	Biology 5, 6 Chemistry 7, 8, 21, 22 Geology 9, 12 Government 4, 5 Latin 12 Mathematics 15, 16 Philosophy 4, 5, 6, 8	
Biology 5, 6 Chemistry 7, 8 Geology 9, 12 Greek 9, 10	Biology 5, 6 Chemistry, 7, 8 Geology 9, 12 Latin 13, 14	

HOUR SCHEDULE OF TECHNICAL

Hr.	Monday	Tuesday	Wednesday
8	French 1, 2 German 4 Mathematics 3, 5, 6 (Sect. A) Spanish 1, 2	French 1, 2 German 4 Mathematics 3, 5, 6 (Sect. A) Spanish 1, 2	French 1, 2 German 4 Mathematics 3, 5, 6 (Sect. A) Spanish 1, 2
9	French 3, 4 (Sect. A) German 4 Mathematics 3, 5, 6 (Sect. B)	French 3, 4 (Sect. A) German 4 Mathematics 3, 5, 6 (Sect. B)	French 3, 4 (Sect. A) German 4 Mathematics 3, 5, 6 (Sect. B)
10	Chemistry 1, 2 Civ. Eng. 2 French 1, 2 German 1, 2, 3, 4	Chemistry 1, 2 Civ. Eng. 2 French 1, 2 German 1, 2, 3, 4	Civ. Eng. 2 French 1, 2 German 1, 2, 3, 4
11	Chemistry 1, 2 Civ. Eng. 2 French 1 Physical Training Spanish 3, 4	Chemistry 1, 2 Civ. Eng. 2 French 1 Physical Training Spanish 3, 4	Civ. Eng. 2 French 1 Spanish 3, 4
1	Civ. Eng. 2 Graphics 1, 2 Spanish 2	Civ. Eng. 2 Graphics 1, 2 Spanish 2	Public lectures and student organization meetings
2	Chemistry 1, 2 Civ. Eng. 2 Graphics 1, 2	Chemistry 1, 2 Civ. Eng. 2 Graphics 1, 2	
3	Chemistry 1, 2 Civ. Eng. 2 Graphics 1, 2	Chemistry 1, 2 Civ. Eng. 2 Graphics 1, 2	
4	Physical Training	Physical Training	

SCHEDULE OF TECHNICAL

Hr.	Monday	Tuesday	Wednesday
8	Mathematics 12 (Civ.) Physics 3, 4 (Lab. Min., Elec., Mech.)	Mathematics 12 (Civ.) Physics 3, 4 (Lab. Min., Elec. Mech.)	Physics 3, 4 (Lecture)
9	Civ. Eng. 4 Physics 3, 4 (Lab. Min., Elec., Mech.)	Civ. Eng. 4 Physics 3, 4 (Lab. Min., Elec., Mech.)	Physics 3, 4 (Quiz)
10	Civ. Eng. 4 Mathematics 11, 12	Civ. Eng. 4 Mathematics 11, 12	Mathematics 11, 12
11	Bible 5 (Sec. A) Civ. Eng. 4, $6^1/_2$ Spanish 3 (Elective)	Bible 5 (Sec. A) Civ. Eng. 4, 6 $^1/_2$ Spanish 3 (Elective)	Civ. Eng. $6^1/_2$ (Civ.) Spanish 3 (Elective)
1	Civ. Eng. 3 English 4 (elective) Spanish 2, 4 (elective)	Chemistry 3, 4 Civ. Eng. 3 English 4 (elective) Spanish 2, 4 (elective)	Public lectures and student organization meetings
2	Civ. Eng. 3 Mech. Eng. 1, 2	Chemistry 3, 4 Civ. Eng. 3 Mech. Eng. 1, 2	
3	Civ. Eng. 3 Mech. Eng. 1, 2	Chemistry 3, 4 Civ. Eng. 3 Mech. Eng. 1, 2	

COURSES, FRESHMAN YEAR

Thursday	Friday	Saturday
French 3, 4 German 1, 2, 3, 4 Spanish 1, 2	French 3, 4 German 1, 2, 3, 4 Spanish 1, 2	French 3, 4 German 1, 2, 3, 4 Spanish 1, 2
English 1, 2	English 1, 2	English 1, 2
Bible 2 (Sec. A) Mathematics 3, 5 (Sect. A) 8 (Sect. B)	Bible 2 (Sec. B) Mathematics 3, 5 (Sect. A) 8 (Sect. A)	Bible 2 (Sec. B) Mathematics 3, 5 (Sect. A) 8 (Sect. A)
Chemistry 1, 2 (Lecture) Mathematics 3, 5 (Sect. B) Physical Training	Chemistry 1, 2 (Lecture) Mathematics 3, 5 (Sect. B) Physical Training	Bible 2 (Sec. A) German 3 Mathematics 3, 5 (Sect. B) 8 (Sect. B)
Civ. Eng. 2 Graphics 1, 2	Civ. Eng. 2 Graphics 1, 2 Spanish 2	
Chemistry 1, 2 Civ. Eng. 2 Graphics 1, 2	Chemistry 1, 2 Civ. Eng. 2 Graphics 1, 2	
Chemistry 1, 2 Civ. Eng. 2 Graphics 1, 2	Chemistry 1, 2 Civ. Eng. 2 Graphics 1, 2	
Physical Training	Physical Training	

COURSES, SOPHOMORE YEAR

Thursday	Friday	Saturday
Physics 3, 4 (Lecture)	Chemistry 3, 4 Mech. Eng. 3, 4 (Civ.) Physics 6	Chemistry 3, 4 Mech. Eng. 3, 4 (Civ.) Physics 6
Physics 3, 4 (Quiz)	Chemistry 3, 4 Mech. Eng. 3, 4 (Civ.) Physics 6	Chemistry 3, 4 Mech. Eng. 3, 4 (Civ.) Physics 6
Bible 5 (Sec. B) English 3 (elective) Mathematics 12 Spanish 1, (elective)	Bible 5 (Sec. B) English 3 (elective) Graphics 4 Spanish 1, (elective)	English 3 (elective) Graphics 4 Spanish 1, (elective)
Graphics 3, 4	Graphics 3, 4	Graphics 3, 4
Civ. Eng. 6½ (Civ.)	English 4 (elective) Spanish 2, 4 (elective)	
Mech. Eng. 1, 2 Physics 3, 4 (Lab. Civ.)	Mech. Eng. 1, 2 Physics 3, 4 (Lab. Civ.)	
Mech. Eng. 1, 2 Physics 3, 4 (Lab. Civ.)	Mech. Eng. 1, 2 Physics 3, 4 (Lab. Civ.)	

HR.	**Monday**	**Tuesday**	**Wednesday**
8	Civ. Eng. 7, 8, 10	Civ. Eng. 7, 10, 20	Civ. Eng. 7, 10, 20
9	Civ. Eng. 5 (Sec. A), 12 Mech. Eng. 5, 6	Civ. Eng. 5 (Sec. B), 12 Mech. Eng. 5, 6	Bible 8 Civ. Eng. 11 Elec. Eng. 7 Mech. Eng. 5
10	Chemistry 9, 10 Elec. Eng. 5 (M.E.), 22 Geology 7, 8	Chemistry 9, 10 Elec. Eng. 2, 5 (M.E.) Geology 7, 8	Biology 10 Elec. Eng. 1, 2 Mech. Eng. 18
11	Elec. Eng. 1, 22 Geology 7, 8	Elec. Eng. 1 Geology 7, 8	Biology 10 Elec. Eng. 5 (Civ. Min.) Mech. Eng. 18
1	Chemistry 13, 14 Civ. Eng. 29, 30 (Mech. Min.), 31 (Civ. C) Elec. Eng. 9 (Civ. A, B)	Chemistry 13, 14 Civ. Eng. 29, 30 (Civ. A, B), 31 (Civ. D) Elec. Eng. 3, 10	Public lectures and student organization meetings
2	Chem. 13, 14 Civ. Eng. 14, 29, 30 (Mech.) 31 (Civ.C) Elec. Eng. 2, 9 (Civ. A.B)	Chemistry 13, 14 Civ. Eng. 29, 30 (Civ. A, B), 31 (Civ. D) Elec. Eng. 6*a*, 9 (Mech.) 10	Biology 10 Chemistry 12 Elec. Eng. 2 Mech. Eng. 6
3	Chemistry 13, 14 Civ. Eng. 29, 30 (Mech. Min.), 31 (Civ. C) Elec. Eng. 9 (Civ. A, B)	Chemistry 13, 14 Civ. Eng. 29, 30 (Civ. A, B), 31 (Civ. D) Elec. Eng. 9, 10 (Mech.)	

SCHEDULE OF TECHNICAL

8	Chemistry 19, 20 Civ. Eng. 17 Elec. Eng. 16*a* History 8 (elect) Mech. Eng. 7, 8	Chemistry 19, 20 Civ. Eng. 17 Elec. Eng. 11*a* History 8 (elect.) Mech. Eng. 7, 8	Chemistry 19, 20 Civ. Eng. 21 Elec. Eng. 11*a* History 8 (elect.) Mech. Eng. 7, 8
9	Civ. Eng. 16 Economics 3, 4 (elect.) Mech. Eng. 9, 10 Philosophy 10 (elect.)	Economics 3, 4 (elect.) Mech. Eng. 9, 10 Philosophy 10 (elect.)	Biology 10 Civ. Eng. 15 Economics 4 (elect.) Philosophy 10 (elect.)
10	Chemistry 21, 22 Civ. Eng. 15*a*, 16 Elec. Eng. 11*a*	Chemistry 21, 22 Civ. Eng. 15, 16 Elec. Eng. 11*b*	Biology 10 Chemistry 21, 22 Civ. Eng. 15, 16 Elec. Eng. 7, 16*a*
11	Chemistry 21, 22 Civ. Eng. 15*a*, 16 Elec. Eng. 15, 22 Spanish 4 (elect.)	Chemistry 21, 22 Civ. Eng. 15, 16 Elec. Eng. 15 Spanish 4 (elect.)	Biology 10 Chemistry 21, 22 Civ. Eng. 15, 16 Elec. Eng. 7 Spanish 4 (elect.)
1	Civ. Eng. 13, 18 Elec. Eng. 24 Geology 11 Mech. Eng. 18	Civ. Eng. 13, 18 Elec. Eng. 24 Geology 11 Mech. Eng. 11, 12	Public lectures and student organization meetings
2	Civ. Eng. 13, 18 Elec. Eng. 13, 24 Geology 11 Mech. Eng. 18	Civ. Eng. 13, 18 Elec. Eng. 13, 24 Geology 11 Mech. Eng. 11, 12	
3	Civ. Eng. 13, 18 Elec. Eng. 13, 24 Geology 11 Mech. Eng. 18	Civ. Eng. 13, 18 Elec. Eng. 13, 24 Geology 11 Mech. Eng. 11, 12	

COURSES JUNIOR YEAR

Thursday	**Friday**	**Saturday**
Civ. Eng. 9, 10 (C.E.) Elec. Eng. 6*b*	Civ. Eng. 9, 10 (C.E.) Elec. Eng. 6*b*	Civ. Eng. 9, 10 (C.E.) Elec. Eng. 6*b*
Bible 8 Civ. Eng. 11 Mech. Eng. 15, 16, 20	Chemistry 7, 8 Civ. Eng. 6 Elec. Eng. 3, 4 Mech. Eng. 15, 16, 20	Chemistry 7, 8 Civ. Eng. 6 Elec. Eng. 1, 2 Mech. Eng. 15, 16, 20
Biology 9, 10 Elec. Eng. 1, 6*a* Mech. Eng. 16, 20	Biology 9 Chemistry 7, 8 Civ. Eng. 5, 6 Elec. Eng. 3, 4	Biology 9 Civ. Eng. 5, 6 Elec. Eng. 6*a*, 21 Geology 9
Biology 9, 10 Elec. Eng. 5 (Civ. Min.) Mech. Eng. 16, 20	Biology 9 Chemistry 7, 8 Civ. Eng. 5, 6 Elec. Eng. 3, 4	Biology 9 Civ. Eng. 5, 6 Elec. Eng. 21 Geology 9
Civ. Eng. 29, 30 (Civ. C, D), 31 (Civ. A) Elec. Eng. 3, 4	Chemistry 7, 8 Civ. Eng. 8, 29, 30 (Elec.), 31 (Civ. B) Elec. Eng. 9 (Civ. C, D), 24	
Civ. Eng. 29, 30 (Min., Civ. C, D), 31 (Civ. A) Elec. Eng. 3, 4	Chemistry 7, 8 Civ. Eng. 14, 29, 30 (Elec.), 31 (Civ. B) Elec. Eng. 9 (Min., Civ. C, D), 24	
Civ. Eng. 29, 30 (Civ. C, D), 31 (Civ. A) Elec. Eng. 3, 4	Chemistry 7, 8 Civ. Eng. 29, 30 (Elec.) Civ. Eng. 31 (Civ. B) Elec. Eng. 9 (Civ. C, D)	

COURSES SENIOR YEAR

Chemistry 21 Civ. Eng. 21 Elec. Eng. 11*a* Law 10	Bible 9 Law 10	Bible 9 Law 10
Biology 10 Chemistry 23 Civ. Eng. 15, 16 Elec. Eng. 7, 16*a* Mech. Eng. 14	Civ. Eng. 15, 16, 23 Elec. Eng. 16*a* Mech. Eng. 14	Civ. Eng. 15, 16, 23 Elec. Eng. 8 Mech. Eng. 18
Biology 9, 10 Chemistry 23 Civ. Eng. 15, 16 Elec. Eng. 7, 11*b*, 16*b* History 4 (elect.) Philosophy 2 (elect.)	Biology 9 Civ. Eng. 15, 16 Elec. Eng. 11*b*, 16*b* History 4 (elect.) Philosophy 2 (elect.)	Biology 9 Civ. Eng. 15*a*, 16 Elec. Eng. 8, 21 Geology 9 History 4 (elect). Mech. Eng. 18 Philosophy 2 (elect.)
Biology 9, 10 Chemistry 23 Civ. Eng. 15, 16, 24 Elec. Eng. 7 History 2 (elect.) Sociology 2 (elect.)	Biology 9 Civ. Eng. 15, 16, 24 Elec. Eng. 11*b*, 16*b* History 2 (elect.) Sociology 2 (elect.)	Geol. 9 Hist. 2 (elect.) Mech. Eng. 8 Sociol. 2 (elect) Biol. 9 Chem. 22 C.E. 15*a*, 16 E.E. 21
Chemistry 23 Civ. Eng. 26 Geology 12 Mech. Eng. 11, 12	Civ. Eng. 36 Elec. Eng. 8, 15 Geology 9, 12 Mech. Eng. 11, 12	
Chemistry 23 Civ. Eng. 25, 26 Geology 12 Mech. Eng. 11, 12	Civ. Eng. 25, 36 Elec. Eng. 8 Geology 9, 12 Mech. Eng. 11, 12	
Civ. Eng. 26 Geology 9, 10, 12 Mech. Eng. 11, 12	Civ. Eng. 36 Elec. Eng. 8 Geology 9, 12 Mech. Eng. 11, 12	

COURSES OF INSTRUCTION

BIBLE

Professor Robinson

2. THE LIFE OF CHRIST.—Required of Arts and Science Freshmen. Second term, 2 hours.
4. THE LIFE OF CHRIST.—Required of Technical Freshmen. Second term. 2 hours.
3. THE CHRISTIAN CHURCH IN THE FIRST CENTURY.—Required of Arts and Science Sophomores. First term. 2 hours.
5. THE CHRISTIAN CHURCH IN THE FIRST CENTURY.—Required of Technical Sophomores. First term. 2 hours.
6. THE HISTORY OF THE JEWISH PEOPLE.—Required of Arts and Science Juniors who do not elect Greek New Testament. (See Greek 16.) Second term. 2 hours.
8. THE HISTORY OF THE JEWISH PEOPLE.—Required of Technical Juniors. Second term. 2 hours.
7. THE ETHICAL AND SPIRITUAL TEACHINGS OF THE PROPHETS.—Required of Arts and Science Seniors. First term. 2 hours.
9. THE ETHICAL AND SPIRITUAL TEACHINGS OF THE PROPHETS.—Required of Technical Seniors. First term. 2 hours.

GROUP I—LANGUAGE AND LITERATURE

ENGLISH

Professors March and Tupper and Messrs. Hutchins, Krichbaum, and Liggett

1–2. COMPOSITION.—Themes. Conferences. Required of all Freshmen. First and Second terms. 3 hours. Professor TUPPER and Messrs. HUTCHINS, KRICHBAUM, and LIGGETT

3. ENGLISH LITERATURE OF THE XVIII AND XIX CENTURIES.—Open only to Sophomores in the Engineering and Chemistry divisions. First term. 3 hours. Professor TUPPER.

4. ENGLISH LITERATURE.—Selected Works. Open only to Sophomores in the Engineering and Chemistry Divisions. Second term. 3 hours. Professor TUPPER.

5–6. AN INTRODUCTION TO THE STUDY OF THE ENGLISH LANGUAGE.—Open to Sophomores in Arts and Science. First and Second terms, The Class of '83 prize. Professor MARCH.

7-8. THE CRITICAL STUDY OF THE TEXT OF SHAKESPEARE.—Open to Juniors and Seniors. First and Second terms. 3 hours. The Shakespeare prize. Professor MARCH.

9. THE WORKS OF OLIVER WENDELL HOLMES.—Open to Juniors and Seniors. First term. 3 hours. The Francis A. March prize. Professor MARCH.

10. ENGLISH PROSE FICTION.—NOVELS—Open to Juniors and Seniors. Second term. 3 hours. Professor MARCH. Omitted in 1917-1918.

12. THE SCIENCE OF LANGUAGE.—Open to Juniors and Seniors. Second term. 3 hours. Professor MARCH.

13-14. THE SHORT STORY.—Open to Juniors and Seniors. First and Second terms. 3 hours. Professor MARCH.

15-16. ENGLISH LITERATURE (EXCLUSIVE OF THE DRAMA), FROM THE BIRTH OF MILTON (1608) TO THE DEATH OF BURNS (1796). —Open to Juniors and Seniors. First and Second terms. 3 hours. Professor TUPPER.

17-18. THE POETRY OF THE NINETEENTH CENTURY.—Open to Juniors and Seniors. First and Second terms. 3 hours. Professor TUPPER.

20. THE MODERN DRAMA.—Open only to qualified Juniors and Seniors. Second term. 3 hours. Professor TUPPER.

21-22. ENGLISH DRAMA FROM THE BEGINNINGS TO SHERIDAN.—Open to Juniors and Seniors. First and Second terms. 3 hours. Professor TUPPER. Omitted in 1917-1918.

23-24. ENGLISH PROSE OF THE NINETEENTH CENTURY.—Open to Juniors and Seniors. First and Second terms. 3 hours. Professor TUPPER. Omitted in 1917-1918.

25. ANGLO-SAXON GRAMMAR AND READING.—Open to Juniors and Seniors. First term. 3 hours. The Early English Text Society's prize. Professor MARCH.

26. CHAUCER.—Open to Juniors and Seniors. Second term. 3 hours. The Lounsbury prize. Professor MARCH.

Candidates for honors in English must complete at least four 3-hour courses, which will include Anglo-Saxon Grammar and Reading, Chaucer, and a year in literature. They must also do such special reading in connection with the courses as the professor in charge may assign, and they must select some author for special study. They must stand an examination at the end of the senior year covering all the work in their honors courses and write a thesis on some subject approved by the department.

THE GREEK LANGUAGE AND LITERATURE

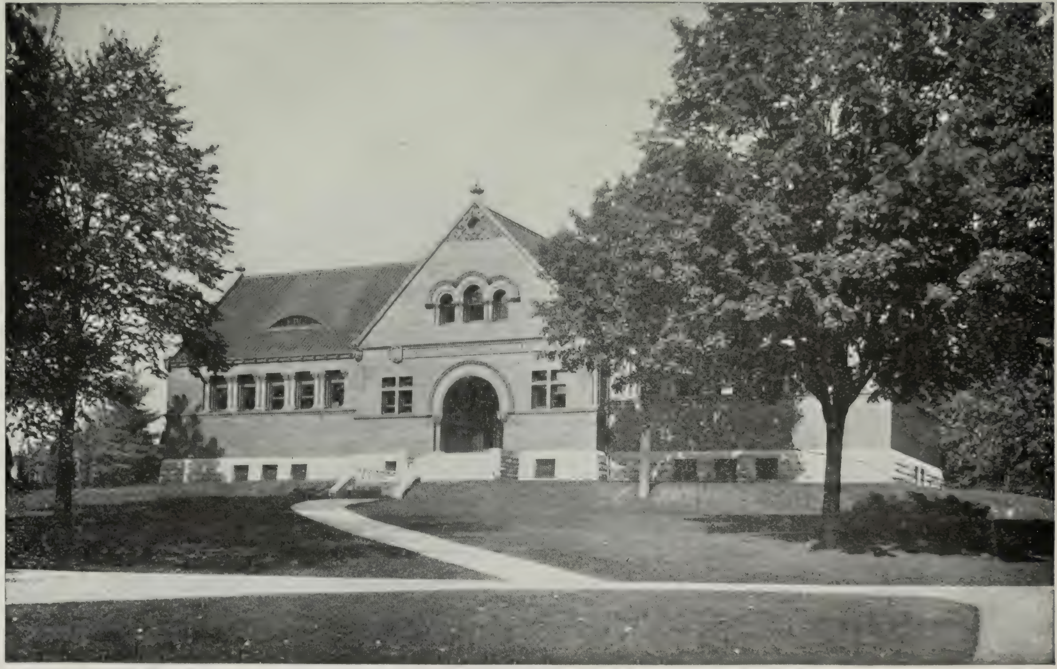
Professor Rankin

For the degree of A.B., one year of Greek is required of students who offer three units of Greek at entrance. A prescribed course (Greek 5 and 6) must be taken in Sophomore year, however, by those who desire to make Greek their major subject in Junior and Senior years.

Students who do not offer Greek at entrance are required to take two years of Greek for the degree of A.B. They, too, may elect Greek as their major subject by taking the prescribed course in their Junior year, in addition to the courses ordinarily required in the case of major subjects.

All Junior and Senior courses are open to Candidates for Honors in the Department of Greek. All such candidates are required to do the supplementary reading announced in connection with the courses described below. Especial attention is called to the fact that properly qualified students may be allowed to take certain courses offered by the Department, even if they possess no knowledge of Greek. Such students will do the required collateral reading in translations of the authors assigned.

1. COURSE FOR BEGINNERS.—Benner and Smyth, *Beginner's Greek Book.* Freshman course, required for the degree of A.B. First term. 3 hours.
2. COURSE FOR BEGINNERS.—Xenophon, *Anabasis* (Murray), selections. Greek Prose Composition (Pearson). Freshman course, required for the degree of A.B. Second term. 3 hours.
3. GREEK LITERATURE.—Homer, *The Odyssey,* Books V–VIII (Perrin). Herodotus, books VII and VIII (Smith and Laird). Greek Prose Composition (Pearson). Sophomore course, required for the degree of A.B. First term. 3 hours. Students who offer Greek at entrance will take this course in their Freshman year.
4. GREEK LITERATURE.—Plato, *The Apology* (Dyer and Seymour). Lysias, *Selected Speeches* (Adams). Euripides, *Iphigenia among the Taurians* (Bates). Primer of Greek Literature (Jebb). Sophomore course, required for the degree of A.B. Second term. 3 hours. Students who offer Greek at entrance will take this course in their Freshman year.
5. THE GREEK DRAMA.—Aeschylus, *Prometheus Bound* (Wecklein-Allen). Sophocles, *Oedipus the King* (Jebb). Aristophanes,



VAN WICKLE MEMORIAL LIBRARY.

The Frogs (Merry). Themes on the Greek Drama and on scenic antiquities. Elective course. First term. 3 hours. Prescribed course for students who make Greek their major subject.

6. GREEK HISTORY AND ORATORY.—Thucydides, books VI and VII (Marchant). Demosthenes, *On the Crown* (Humphreys). Themes on subjects connected with the Peloponnesian War and the rise of Macedon. Elective course. Second term. 3 hours. Prescribed course for students who make Greek their major subject.
7. THE HISTORY OF GREECE.—Bury, *A History of Greece to the Death of Alexander the Great* (edition of 1913). Lectures and recitations. Collateral reading in translations of the Greek Historians and in the larger works of Bury, Grote, Curtius, Holm and others. Junior course, prescribed for students who make Greek their major subject. First term. 3 hours. The course may be taken by properly qualified Juniors, whether they have taken Greek or not.

Candidates for Honors will do collateral reading in the original texts of the Greek Historians, in addition to the reading required of all students in this course.

8. THE HISTORY OF GREEK LITERATURE.—Wright, *A Short History of Greek Literature.* Collateral reading, in the authors less commonly read, in Wright and Abbott's *Golden Treasury of Ancient Greek Poetry* and in Wright and Shadwell's *Golden Treasury of Greek Prose.* Junior course, prescribed for students who make Greek their major subject. Second term. 3 hours. The course may be taken by properly qualified Juniors, whether they have taken Greek or not.

Candidates for Honors will do additional collateral reading and prepare a special report upon some selected author.

9. THE GREEK EPIC.—Homer, *The Iliad* (Monro). The entire *Iliad* will be read, in the original text and in translations, and a certain number of lectures will be given on Homeric antiquities and on Homer's influence upon ancient and modern literature. Junior course. First term. 3 hours. Omitted in 1916–1917.

Candidates for Honors will read the entire *Iliad* in the original Greek and prepare a written report on some assigned subject.

10. THE GREEK COMEDY.—Aristophanes, *Acharnians* (Merry) and *Clouds* (Forman). Menander, fragmentary plays (Capps). Lectures and collateral reading on the origin and development of Greek Comedy. Junior course. Second term. 3 hours.

Candidates for Honors will also read the *Birds* and *Knights* of Aristophanes.

11. GREEK PHILOSOPHY.—Plato, *Republic* (Adam), books II, VI and VIII, with large parts of the other books. Lectures, with a limited amount of collateral reading, on the pre-Socratic philosophers and the philosophy of the Socratic school. Senior course. First term. 3 hours. Omitted in 1916–1917.

Candidates for Honors will read the *Republic*, entire, and do additional collateral reading.

12. GREEK PHILOSOPHY.—Aristotle, *Nicomachean Ethics* (Bywater), books I, II, III and X, with parts of books IV and V. Lectures, with collateral reading, on the Aristotelian school, with particular reference to Aristotle's place in the history of ethical thought. Senior course. Second term. 3 hours. Omitted in 1916–1917.

Candidates for Honors will read books I–VII, and X, and will do additional collateral reading.

13. THE GREEK LYRIC POETS.—Tyler, *Selections from the Greek Lyric Poets.* Seymour, *Selected Odes of Pindar.* Lectures, and collateral reading, on the historical development of Greek lyric poetry. Senior course. First term. 3 hours. Omitted in 1916–1917.

Candidates for Honors will read about six hundred verses of Pindar and Bacchylides in addition to the work assigned for the other members of the class.

14. THE GREEK PASTORAL, WITH SOME STUDY OF THE MIME.—Theocritus, Bion, Moschus, and Herondas. Wilamowitz-Moellendorf, *Bucolici Graeci.* Crusius, *Herondae Mimiambi.* Lectures and collateral reading, with particular reference to the influence of the Greek Pastoral on modern literature. Senior course. Second term. 3 hours. Omitted in 1916–1917.

Candidates for Honors will read all the Idyls of Theocritus.

15. LUCIAN AND HIS TIMES.—Allinson, *Lucian: Selected Writings.* Lectures and collateral reading, with reports on special topics of investigation relating to the life, morals and beliefs of the second century A.D. and to Lucian's use of a new literary type and his influence on later literature. Junior course. First term. 3 hours.

Candidates for Honors will be assigned additional reading in Lucian's works and will present a report based on original investigation.

16. THE NEW TESTAMENT IN GREEK.—Elective course for Juniors. Second term. 2 hours. Professor Rankin.

20. GREEK PROSE COMPOSITION.—Translation from standard English authors and original essays based on classical models. Senior

course, prescribed for students who elect Greek as their major subject. First and second terms. 1 hour. Omitted in 1916–1917.

LATIN

Professor Owen, Assistant Professor Lacey

1. Livy, Horace, Odes.—The Punic Wars. Latin Prose. First term, Freshman. 3 hours. Professors Owen and Lacey.
2. Horace, Odes and Epodes, Satires and Letters.—Roman Life. Latin Prose. Second term, Freshman. 3 hours. Professors Owen and Lacey.
3. Cicero, De Oratore.—Latin Hymns. Roman History from the Gracchi to Augustus. First term, Sophomore. 3 hours. Professors Owen and Lacey.
4. Cicero, De Officiis.—Moral Philosophy. Latin Hymns. Early Roman History. Second term, Sophomore. 3 hours. Professors Owen and Lacey.
5. Tacitus, Agricola and Germania.—Epistolary Latin. Pliny's Letters. Open to Juniors and Seniors. First term. 3 hours. Offered in 1917–1918. Professor Owen.
6. Tacitus, Annals.—Epistolary Latin. Letters of Cicero. Open to Juniors and Seniors. Second term. 3 hours. Offered in 1917–1918. Professor Owen.
7. Juvenal, Satires.—Terence, *Phormio*. Roman Archaeology. Open to Juniors and Seniors. First term. 3 hours. Offered in 1916–1917. Professor Owen.
8. Lucretius.—Terence or Plautus. Open to Juniors and Seniors. Second term. 3 hours. Offered in 1916–1917. Professor Owen.
10. Latin Epigraphy.—An introduction to the study of inscriptions. Special attention given to inscriptions which bear upon Roman official life. Second term. Open to Juniors and Seniors. 1 hour or 3 hours. Offered in 1917. Professor Lacey.
12. Catullus and Tibullus.—Selections from the Odes of Catullus and the Elegies of Tibullus. The relation of these poets to other poets of their time. Second term. Open to Juniors and Seniors. 3 hours. Offered in 1917. Professor Lacey.

13–14. Latin Composition.—Written exercises and translation at hearing and at sight. Important for those who expect to teach Latin. First and second terms. Open to Juniors and Seniors. 1 hour. Offered in 1916-1917. Professor Lacey.

MODERN LANGUAGES

Professor Fehr, Assistant Professor Hopkins, Assistant Professor Jones, Mr. Luker, Mr. Seneca

In the A.B. course, German 1 or French 1 will be scheduled: provided these have not been used for entrance. If two units of either of these languages are offered for entrance, then French 3 or German 3 must be scheduled.

In the Ph.B. course either of the following alternates is required: (1) Three years of one modern language and one year of some other, including preparatory work; or (2) two years of each of two modern languages, including preparatory work.

In the B.S. course, two years in both French and German, including preparatory work, must be completed.

In the engineering courses any modern language is scheduled for the Freshman year, as the entering student may elect. In the first term of the Sophomore year an opportunity is offered to take any modern language.

In the pre-medical and Chemistry courses German is required in the Freshman year.

FRENCH

French 1. ELEMENTARY FRENCH.—Grammar, prose composition, conversation, translation of easy prose. First term. 3 hours.

French 2. ELEMENTARY FRENCH, continued.—Translation and sight-reading from standard authors. Prose composition. Second term. 3 hours.

French 3. INTERMEDIATE FRENCH.—Prescribed for those offering French for entrance. Rapid reading of various modern authors. First term. 3 hours.

French 4. ADVANCED FRENCH.—Continuation of French 3. Second term. 3 hours.

French 5. FRENCH COMPOSITION AND CONVERSATION.—Open to students who have completed 1 and 2. First term. 3 hours.

French 6. FRENCH COMPOSITION AND CONVERSATION.—Continuation of 4. Second term. 3 hours.

French 21. FRENCH HISTORICAL PROSE.—Reading from various French historians. Collateral reading and reports. First term. 3 hours.

French 22. THE MODERN NOVEL.—Collateral reading and reports. Second term. 3 hours.

French 23. FRENCH TRAGEDY.—A study of the tragedy from Corneille to Rostand. Collateral readings and reports. Lectures. First term. 3 hours.

French 24. FRENCH COMEDY.—The comedy from Molière to Dumas *fils*. Collateral readings and reports. Lectures. Second term. 3 hours.

French 25. THE LITERATURE OF THE SEVENTEENTH CENTURY.—A rapid study of the principal authors. Collateral reading and reports. Lectures. First term. 3 hours. Omitted in 1916–17.

French 26. FRENCH LYRIC POETRY.—Attention will be given to some of the famous French songs. Second term. 3 hours. Omitted in 1916–17.

GERMAN

German 1. ELEMENTARY GERMAN.—Grammar and reading. Written and oral work. First term. 3 hours.

German 2. ELEMENTARY GERMAN.—Continued. Second term. 3 hours.

German 3. INTERMEDIATE GERMAN.—German syntax, prose composition, and the reading of more difficult prose. Preparation required: German 1 and 2, or a minimum of 2 units offered for entrance. First term. 3 hours.

German 4. ADVANCED GERMAN.—Rapid reading of historical novels relating to the history and development of the Teutonic race. Preparation required: German 3, or a minimum of 3 units offered for entrance. Second term. 3 hours.

German 11. NINETEENTH CENTURY WRITERS.—Preparation: German 3 and 4. First term. 3 hours.

German 12. NINETEENTH CENTURY WRITERS.—Second term. 3 hours.

German 13. SCHILLER AND HIS WORKS.—Preparation: German 3 and 4. First term. 3 hours. Offered in 1916–17.

German 14. SCHILLER AND HIS WORKS.—Continued. Second term. 3 hours.

German 15. GOETHE AND HIS WORKS.—First term. 3 hours. Offered in 1917–18.

German 16. GOETHE AND HIS WORKS.—Continued. Second term. 3 hours. Offered in 1917–18.

German 21. GOETHE'S FAUST.—Preparation: German 11 and 12, or 13 and 14. To be offered in 1917–18. First term. 3 hours.

German 22. GOETHE'S FAUST.—Continued. Second term. 3 hours.

German 23. GRILLPARZER AND HIS WORKS.—To be offered in 1916–17 and 1918–19. First term. 3 hours.

German 24. GRILLPARZER AND HIS WORKS.—Continued. Second term. 3 hours.

German 27. HISTORY OF GERMAN LITERATURE.—First term. 3 hours.

German 28. TEACHER'S COURSE.—A critical study of the methods of teaching modern languages. Phonetics. Selection and criticism of text-books. Second term. 3 hours.

German 31. MIDDLE HIGH GERMAN.—First term. 3 hours.

German 32. MIDDLE HIGH GERMAN.—Continued. Second term. 3 hours.

ITALIAN

Italian 1. ELEMENTARY ITALIAN.—Grammar, simple prose composition, reading of easy prose. First term. Three hours.

Italian 2. INTERMEDIATE ITALIAN.—Reading of modern Italian prose such as Manzoni's *I Promessi Sposi*. Second term. Three hours.

Italian 3. DANTE.—Reading of selected *canti* of the *Divina Commedia*. A study of Dante and his place in Florentine history. First term. Three hours.

Italian 4. (*a*) BOCCACCIO.—Selected *novelle* from the *Decamerone* are read. Discussions as to the origin of some of the tales. (*b*) *Petrarch*.—A study of the Sonnet, Madrigal, Canzone, etc. Second term. Three hours.

SPANISH

Spanish 1. ELEMENTARY SPANISH.—Grammar, prose composition, conversation. First term. 3 hours.

Spanish 2. ELEMENTARY SPANISH.—Continuation of 1. Translation and sight-reading from easy prose. Second term. 3 hours.

Spanish 3. INTERMEDIATE SPANISH.—Translation and sight-reading. First term. 3 hours.

Spanish 4. ADVANCED SPANISH.—Continuation of 2. Special attention is given in this course to technical Spanish, Spanish periodicals and Spanish business forms. Second term. 3 hours.

Spanish 5. COMPOSITION AND CONVERSATION.—Open to students who have completed 1 and 2. First term. 3 hours.

Spanish 6. COMPOSITION AND CONVERSATION.—Continuation of 5. Second term. 3 hours.

Spanish 7. SPANISH DRAMA.—Reading from various dramatists. Collateral reading and reports. Lectures. First term. 3 hours.

Spanish 8. SPANISH DRAMA.—Continuation of 7. Second term. 3 hours.

Spanish 9. CERVANTES.—Readings from *Don Quixote*. Lectures. First term. 3 hours.

Spanish 10. CERVANTES.—Continuation of 9. Second term. 3 hours.

Spanish 11. THE SPANISH NOVEL OF THE 16TH CENTURY.—Especial study will be made of the picaresque type. First term. 3 hours. Omitted in 1916–17.

Spanish 12. THE SPANISH NOVEL OF THE 16TH CENTURY.—Continuation of 11. Second term. 3 hours. Omitted in 1916–17.

GROUP II—EDUCATION, HISTORY, PHILOSOPHY AND POLITICAL SCIENCE

ECONOMICS

Professor Dickey

2. PRINCIPLES OF ECONOMICS.—This course gives consideration to the leading factors in our economic system, treating of such subjects as the production and consumption of wealth, business organization, value, monopoly, money and banking, protection and free trade, rent, wages, interest, profits, transportation, socialism, taxation, etc. Second term. 3 hours.

3. CORPORATIONS AND TRUSTS.—A thorough and comprehensive treatment of the leading features of modern business organization and administration. First term. 2 hours. To be given in 1917–18.

3*c*. BUSINESS CORPORATIONS, TRUSTS AND LABOR PROBLEMS.—First term, Senior year. 4 hours. Co-operative course.

4. MONEY AND BANKING.—The essential object in this course is an understanding of the part that credit plays in modern business. The subject will be treated in part historically. Especial attention will be given to the Federal Reserve system. Second term. 3 hours. Prerequisite, Course 2.

5. TRANSPORTATION AND TRADE.—A large portion of the time in this course will be given to the development and significance of railway transportation. Consideration will also be given to foreign trade and exchange. First term. 2 hours.

Note.—Courses 3 and 5 may be taken as three-hour courses by those who desire to do sufficient additional work to satisfy the requirements.

GOVERNMENT AND LAW

Professor Dickey

1, 2. American Government and Politics.—A general survey course in the organization and workings of national, state, and local government in the United States. The first term will be given to a study of the Federal government with special emphasis on the functional side. The second term will be devoted to state and local governments, but more especially to municipal government. Those students who desire to pursue major or minor work in Government are urged to take the full year's course. First and second term. 3 hours. Professor Dickey.

3. Municipal Administration.—This course is designed to acquaint the student with the practical operations of municipal government and to promote study of some of its most vital social and economic problems. First term. 3 hours. Prerequisite, Course 2. Professor Dickey.

4. International Law.—A course in the essential principles of the recognized system of International Law, including a study of the controverted questions arising out of the Great War. Second term. 3 hours. Professor Dickey.

5. National Governments.—A comparative survey of the governmental systems of the leading modern states. The course will deal with practical problems and political tendencies in the governments treated as well as with their organization. First term. 3 hours. Prerequisite, Course 1. Professor Dickey.

9. Law.—Blackstone's Commentaries. First term. 3 hours. Mr. Kirkpatrick.

10. Business Law.—Contracts, agency, partnership, corporations, sales, insurance, bankruptcy and negotiable paper. Second term. 3 hours. Mr. Kirkpatrick.

10*c*. Business Law.—Contracts, agency, partnership, corporations, sales, insurance, estates, and negotiable paper. Second term, Senior year. 4 hours. Co-operative course.

HISTORY

Professor Heckel

2. Modern European History.—Introductory Course. Second term. 3 hours. Professor Heckel.

3. History of England.—Tudor and Stuart dynasties. First term. 3 hours. Professor Heckel. Not given in 1916–17.

4. American Political and Constitutional History.—From the Revolution to the Civil War. Second term. 3 hours.
5. American History.—From the Civil War to the present. First term. 3 hours. Professor Heckel.
7. Mediaeval Europe.—From the barbarian migrations to the Renaissance. Open to Juniors and Seniors. First term. 3 hours.
8. Renaissance and Reformation.—Open to Juniors and Seniors. Second term. 3 hours.
9. Church History.—History of the Christian Church to the fifteenth century. First term. 3 hours. Given alternately with No. 7. Professor Heckel. Not given in 1916–1917.
10. Seminar in English History.—Second term. 3 hours. Given alternately with No. 8. Professor Heckel. Not given in 1916–17.
11. History of England.—Political and Constitutional History of the eighteenth and nineteenth centuries. First term. 3 hours. Given alternately with No. 3.

History of Greece.—See announcement in Department of Greek, No. 7. First term. 3 hours.

PHILOSOPHY

Professor Martin

The courses offered in this department are Psychology, Logic, Ethics, Theism, History of Philosophy and Metaphysics. These are open to Juniors and Seniors, but should be taken in the order in which they are mentioned below.

1. Psychology.—Chiefly text-book work with assigned reading and supplementary lectures. Text-book, James' *Briefer Course.* First term. 3 hours.
2. Logic.—Text-book and exercises. Second term. 3 hours.
3. Ethics.—Lectures, assigned readings and themes. Elementary course in psychology is required for entrance to this course. First term. 3 hours.
4. Theism.—Text-book, Flint's *Theism*, and lectures. Second term. 1 hour.
5. History of Ancient Philosophy.—First term. 3 hours.
6. History of Modern Philosophy.—Second term. 2 hours.
8. Metaphysics.—Alternating with History of Modern Philosophy and Theism. Second term. 3 hours.

Pedagogy.—In connection with the courses in Philosophy, provision is made for such courses in Pedagogy as are required by the

States of Pennsylvania and New Jersey of applicants for certificate to teach in the public schools of those states. More advanced study in Pedagogy is provided from time to time as may be demanded.

9. HISTORY OF EDUCATION.—Text-book, Monroe. Lectures and themes. First term. 3 hours.
10. EDUCATIONAL PSYCHOLOGY.—Text-book. Lectures and experiments. Second term. 3 hours.

LECTURES ON EDUCATION.—The regular instruction in this department is supplemented by lectures bearing more directly on the practical side of the teacher's work.

SOCIOLOGY

1. PRINCIPLES OF SOCIOLOGY.—A general survey of the field. Students should take this course before Course 2. First term. 3 hours.
2. PRACTICAL SOCIOLOGY.—Second term. 3 hours.

GROUP III—MATHEMATICS AND SCIENCE

PARDEE SCIENTIFIC DEPARTMENT

BIOLOGY

Professor Kunkel, Assistant Professor Foster

All courses involve 5 hours of laboratory work a week and 1 hour recitation or quiz.

1. GENERAL BIOLOGY.—Preliminary to all other courses in Biology offered except Sanitary Biology. Open to all classes as an elective. Required of Pre-medical students in Freshman year. First term. 3 hours. Professor KUNKEL.
2. BACTERIOLOGY.—Open to Juniors and Seniors who have had Biology 1. Required of Pre-medical students in Sophomore year. Second term. 3 hours. Assistant Professor FOSTER.
3. BOTANY.—Open to all students who have had Biology 1. Required of Pre-medical students in Sophomore year. First term. 3 hours. Assistant Professor FOSTER.
4. VERTEBRATE ZOÖLOGY.—Open to all students who have had Biology 1. Required of Pre-medical students in Freshman year. Second term. 3 hours. Professor KUNKEL.
5. PHYSIOLOGY.—Open to Juniors and Seniors who have had Biology 1. Required of Pre-medical students in Sophomore year in

1917–18 and in alternate years. This course alternates with 7. First term. 3 hours. Professor KUNKEL.

7. INVERTEBRATE ZOÖLOGY.—Open to Juniors and Seniors who have had Biology 1. Required of Pre-medical students in Sophomore year in 1916–17 and in alternate years. First term. 3 hours. Professor KUNKEL.

6. EMBRYOLOGY.—Open to Juniors and Seniors who have had Biology 1 and either 4 or 7. Required of Pre-medical students in Sophomore year. Second term. 3 hours. Professor KUNKEL.

9. SANITARY BIOLOGY.—Required of mechanical and mining engineers and chemists. First term. 3 hours. Assistant Professor FOSTER.

10. SANITARY BIOLOGY.—Required of civil engineers and students in the general scientific course. (A repetition of 9.) Second term. 3 hours. Assistant Professor FOSTER.

CHEMISTRY

Professors Bingham, Hart, Wysor, Assistant Professor Wilson, Messrs. DeLong and van Klooster

There are two professional courses in Chemistry, leading, respectively, to the degrees of Bachelor of Science in Chemistry, and of Bachelor of Science in Chemical Engineering.

THE CHEMICAL COURSE

The first course gives a broad chemical training intended for those who are preparing to become analytical chemists or teachers of chemistry. It is particularly adapted for those who expect to do graduate work in chemistry or medicine.

THE CHEMICAL ENGINEERING COURSE.

The second course was arranged in response to recent demands for graduates in chemistry with some knowledge of engineering. The course, therefore, combines an intensive training in chemistry with appropriate engineering studies. The student is, in this way, fitted for construction work and management. With this in view, a course is also given in industrial management.

Those who take either of the Chemical courses receive the same instruction as the other engineering students in mathematics, drawing, shop-work, modern languages, physics and elementary chemistry during the Freshman and Sophomore years, up to and including quantitative analysis.

Since 1914 the demand for chemists has far exceeded the supply. Hence it is not difficult to obtain well-paid positions for men of good character. In view of the location of the College, it is fitting that special attention is paid to analytical chemistry, the cement industry, metallurgy and assaying.

EQUIPMENT

Gayley Hall is a fire-proof structure devoted entirely to the work in Chemistry. There are four large laboratories, besides four of smaller size, a shop, three stock rooms, two balance rooms, two quiz rooms, a lecture room with seats for 125 students, a pleasant room containing the museum and the volumes of the Henry W. Oliver Chemical and Metallurgical Library, four rooms for instructors and one room for industrial research.

The two laboratories for Elementary Chemistry accommodate about 300 students. The two advanced laboratories can accommodate 88 students in each. Water and gas are supplied to each student, and each room is supplied with air blast and electric current. The laboratories are well lighted and steam-heated. The smaller laboratories are arranged for assaying, microscopic and photographic work.

The Metallurgical laboratory is located in South College. The laboratory is equipped with coal, oil and gas calorimeters, heat-treatment furnaces, pyrometers, apparatus for testing hardness, etc., and a complete metallographic outfit.

1. ELEMENTARY INORGANIC CHEMISTRY.—Freshman year. First term. Required of all Engineers, Chemists and Pre-medicals. Two lectures, one recitation and 3 hours of laboratory work. Text-books: Mellor's *Modern Inorganic Chemistry*, and Bingham and White's *Laboratory Manual of Inorganic Chemistry*. Candidates for the B.A., B.S. and Ph.B. degrees have their lectures on Friday and Saturday at 10 and their laboratory and recitations on Thursday at 10 and on Thursday, Friday and Saturday at 11. Technical students have their lectures on Monday and Tuesday at 11 and their laboratory and recitations on either Monday and Tuesday P.M. or on Thursday and Friday P.M. from 2 to 4. Professor BINGHAM, Professor WILSON and Dr. VAN KLOOSTER.
2. ELEMENTARY INORGANIC CHEMISTRY.—Freshman year. Second term. Required of all Engineers, Chemists and Pre-medicals. Prerequisite 1. The laboratory work of 1 is devoted to Inorganic Preparations, but in 2 Qualitative Analysis is begun.

3. ADVANCED QUALITATIVE ANALYSIS.—Sophomore year. First term. Required of Chemical, Mining, Mechanical, and Electrical Engineers, Chemists and Pre-medicals. Prerequisites 1 and 2. One lecture and 2 hours laboratory work. Text-book: Stieglitz' *Qualitative Analysis*. Mr. DELONG.

4. ADVANCED QUALITATIVE ANALYSIS.—Sophomore year. Second term. Required of Chemical and Mining Engineers, Chemists and Pre-medicals. Prerequisite 3.

5. ORGANIC CHEMISTRY.—Sophomore year. First term. Required of Chemical Engineers, Chemists and Pre-medicals. Prerequisite 2. Two lectures and 3 hours laboratory work. Perkin and Kipping's *Organic Chemistry* and Gattermann's *Practical Organic Chemistry*. Professor WILSON.

6. ORGANIC CHEMISTRY.—Sophomore year. Second term. Required of Chemical Engineers, Chemists and Pre-medicals. Prerequisite 5.

7. QUANTITATIVE ANALYSIS.—Junior year. First term. Required of Chemical Engineers and Chemists. Prerequisite 2. One lecture and six hours of laboratory work. Analysis of Ores, Metals, Water and Gas. Text-book: Wysor's *Analysis of Metallurgical and Engineering Materials*. Professor WYSOR.

8. QUANTITATIVE ANALYSIS.—Junior year. Second term. Required of Chemical Engineers and Chemists. Prerequisite 7. Candidates for B.S in Chemistry. Two lectures and ten hours of laboratory work. For all others, one lecture and six hours of laboratory work.

9. PHYSICAL CHEMISTRY.—Junior year. First term. Required of Chemical Engineers and Chemists. Prerequisite 6. Two lectures and one hour of laboratory work. Text-book: Senter's *Physical Chemistry*. Professor WILSON.

10. PHYSICAL CHEMISTRY.—Junior year. Second term. Required of Chemical Engineers and Chemists. Prerequisite 9.

11. STOICHIOMETRY.—Junior year. First term. Required of Chemical Engineers and Chemists. Prerequisite 2. One lecture. Text-book: Miller's *Calculations of Analytical Chemistry*. Mr. DELONG.

12. STOICHIOMETRY.—Junior year. Second term. Required of Chemical Engineers and Chemists. Prerequisite 11.

13. METALLURGY.—Junior year. First term. Prerequisite 2. Two lectures. Four hours of laboratory work. Text-book: Wysor's *Metallurgy*. Professor WYSOR.

14. METALLURGY.—Junior year. Second term. Required of Chemical and Mining Engineers and Chemists. Prerequisites 11 and 13.

16. METALLURGY.—Junior year. Second term. Required of Chemical and Mining Engineers and Chemists. Candidates for B.S. in Mechanical Engineering. Two lectures and four hours of laboratory work. Text-book: Wysor's *Metallurgy.* Professor WYSOR.

17. ADVANCED ORGANIC CHEMISTRY.—Junior year. First term. Required of Chemists. Prerequisite 6. Three lectures. Professor BINGHAM.

18. ADVANCED ORGANIC CHEMISTRY.—Junior year. Second term. Required of Chemists. Prerequisite 17.

19. CHEMICAL ENGINEERING.—Senior year. First term. Required of Chemical Engineers and Chemists. Prerequisites 6, 8, 10, 12, 14. Two lectures. One recitation. Professor HART.

20. CHEMICAL TECHNOLOGY.—Senior year. Second term. Required of Chemical Engineers and Chemists. Prerequisite 19. Professor HART.

21. ADVANCED QUANTITATIVE ANALYSIS AND THESIS WORK.—Senior year. First term. Required of Chemical Engineers and Chemists. Prerequisites 8, 10, 12. Two lectures and sixteen hours of laboratory work. Assaying, Organic Analysis, Agricultural Analysis. The student in this course is allowed to elect work best suited to his needs. Candidates for Chemical Engineering, one lecture and ten hours of laboratory work. Text-books: *U. S. Government Official Methods* and Fulton's *Principles of Fire Assaying.* Professor WYSOR.

22. ADVANCED QUANTITATIVE ANALYSIS AND THESIS WORK.—Senior year. Second term. Required of Chemical Engineers and Chemists. Prerequisite 21.

23. ASSAYING.—Senior year. First term. Required of Candidates for B.S in Mining Engineering. Five hours of laboratory work. Text-book: Fulton's *Principles of Fire Assaying.* Professor WYSOR.

25. CHEMICAL GERMAN.—First term. Junior year. Prerequisite German 2. Required of Chemists 1 hour per week. Phillips' *Chemical German.* Mr. DELONG.

26. CHEMICAL GERMAN.—Second term. Junior year. Prerequisite Chemistry 25.

27. Chemical German.—First term. Senior year. Prerequisite Chemistry 26. Required of Chemists 1 hour per week. Phillips' *Chemical German*. Mr. DeLong.
28. Chemical German.—Second term. Senior year. Prerequisite Chemistry 27.

GEOLOGY

Professor Peck and Mr. Fretz

1. Dynamical, Structural and Physiographical Geology.—Elective for Juniors and Seniors. First term. 3 hours.
2. Historical Geology.—Elective for Juniors and Seniors. Second term. 3 hours.
3. Field Geology.—Followed by Paleontology. Elective for Juniors and Seniors. Courses 3 and 4, presuppose Courses 1 and 2. First term. 3 hours.
4. Tertiary Mammals.—Man and the Glacial Period. Elective for Juniors and Seniors. Second term. 3 hours.
5. Crystallography.—Elective for Juniors and Seniors proposing to Major in Geology. First term. 3 hours.
6. Petrography.—Elective for Juniors and Seniors proposing to Major in Geology. Second term. 3 hours.
7. General Geology.—Short Course. Required for Junior Civils, Chemists and Miners. First term. 2 hours.
8. General Geology.—Continued. Short Course. Required for Junior Civils, Chemists and Miners. Second term. 2 hours.
9. Geology of Ore Deposits.—Required for Senior Chemists and Miners. First term. 2 hours.
10. Geology of Ore Deposits.—Continued. Required for Senior Chemists and Miners. Second term. 2 hours.
11. Systematic Mineralogy.—Required for the Senior Chemists and Miners. First term. 2 hours.
12. Petrography and Goniometrical Measurements.—Required for Senior Chemists and Miners. Second term. 2 hours.

GRAPHICS

Professor Graves and Mr. Holden

1. Drawing, Lettering and Projection.—First term, Freshman year. Required of candidates for B.S., and B.S. in Engineering or Chemistry. Text-books, Graves' *Mechanical Drawing*, and Graves' *Free-hand Lettering*. 2 3-hour periods per week.

a. DRAWING.—Lectures on instruments and materials; elementary plates to afford practice in using the drawing instruments and illustrate the simpler operations of drawing; recitations and drawing plates on conic sections.

b. LETTERING.—Class-room study of, and drafting-room practice in making, lower case and capital letters suitable for general engineering drawing; the lettering of connected sentences to acquire facility in spacing; lettering for titles.

c. ORTHOGRAPHIC PROJECTION.—Recitations and drawing plates to train the technical imagination and power of visualization in three dimensions through the projection and successive revolutions of various solids.

2. DRAWING, FREEHAND SKETCHING AND ISOMETRIC.—Second term. Freshman year. Required of candidates for B.S., and B.S. in Engineering or Chemistry. Text-book, Graves' *Mechanical Drawing*. 2 3-hour periods per week.

a. DRAWING.—Working drawings of machine details, screw threads, bolts, etc.; drawing of large structures taken from detail sketches and uncompleted views such as bent for a timber trestle, timber highway bridge, built up steel columns and girders; tracing and blue printing.

b. FREEHAND SKETCHING.—Sketches of various machine details from which working drawings are made: a systematic study of dimensioning and line shading.

c. ISOMETRIC DRAWING.—Sketches and drawings of various objects in isometric; transposition from orthographic projection to isometric.

3. DESCRIPTIVE GEOMETRY.—First term, Sophomore year. Required of all candidates in Engineering. Text-books, Church and Bartlet's *Descriptive Geometry* and Graves' *Descriptive Geometry Problems*. Problems on the point line and plane. Particular emphasis is laid on the necessity to mentally visualize the various problems. 2 1-hour recitations and 1 1-hour drawing period per week.

4. DESCRIPTIVE GEOMETRY—MACHINE DRAWING.—Required of all candidates in Engineering. Text-books, Church and Bartlet's *Descriptive Geometry*, Graves' *Descriptive Geometry Problems* and Graves' *Notes on Machine Drawing*. 1 1-hour recitation and 2 2-hour drawing periods per week.

a. DESCRIPTIVE GEOMETRY.—Generation and properties of surfaces of single and double curvature; warped surfaces; intersections and

GAYLEY LABORATORY OF CHEMISTRY AND METALLURGY

developments; shade and shadows; perspective; and a continuation of *2c* in isometric.

b. MACHINE DRAWING.—A continuation of *2b*. Freehand sketches of machine parts such as pulleys, shaft hangers, gate valves, eccentrics, etc.; details and assembly of a model water pump; from the sketches, drawings and tracings are made.

MATHEMATICS AND ASTRONOMY

Professors Hall, Smith, Marquard, Hatch and Messrs. Cawley and Snyder

It is strongly recommended that Algebra be thoroughly reviewed just before admission to college.

Students in the A.B. and Ph.B. courses who desire to take the advanced mathematics of the last two years must elect Sophomore mathematics.

1. ALGEBRA.—Quadratic equations, exponents, surds and imaginaries, ratio and proportion, variation, progressions, binomial theorem determinants, series, theory of equations and logarithms. Required of Arts and Science Freshmen. First term. 3 hours.
2. SOLID GEOMETRY.—Required of Arts and Science Freshmen. Two-thirds of second term. 3 hours. 2 credit hours.
3. ALGEBRA.—Ratio and proportion, variables and limits, binomial theorem, inequalities, indeterminate equations, choice and chance, logarithms, determinants, complex numbers, series and theory of equations. Text-book, Fite's *College Algebra*. Required of Engineering and Chemistry Freshmen. Ten weeks of first term. 6 hours. 4 credit hours.
4. TRIGONOMETRY.—Required of Arts and Science Freshmen. One-third of second term. 3 hours. 1 credit hour.
5. TRIGONOMETRY.—Plane and Spherical Trigonometry. Text-book, Murray's *Trigonometry*. Required of Engineering and Chemistry Freshmen. Six weeks of first term. 6 hours. 2 credit hours.
6. ANALYTICAL GEOMETRY.—Plane and Solid Analytic Geometry. Text-book, Phillips' *Analytic Geometry*. Required of Engineering and Chemistry Freshmen. Second term. 3 hours.
7. TRIGONOMETRY.—(Continuation of 4.) Plane and Solid Trigonometry. Required of Science Sophomores and elective for other Sophomores and Juniors. First term. 3 hours.
8. LABORATORY MATHEMATICS.—Applications of Mathematics and solution of practical problems. Text-book, Hall's *Mensuration*

and reference books. Required of Engineering and Chemistry Freshmen. Second term. 1 hour.

10. ANALYTICAL GEOMETRY.—Required of Science Sophomores and elective for other Sophomores and Juniors. Second term. 3 hours.

11. DIFFERENTIAL CALCULUS.—Differentiation of all the functions of one or more variables, successive differentiation, implicit functions, development of functions, evaluation of indeterminate forms, maxima and minima, properties of curves and applications in mechanics. Text-book, Hall's *Calculus*. Required of Engineering and Chemistry Sophomores. First term. 3 hours.

12. INTEGRAL CALCULUS.—Integration of rational, irrational and transcendental functions, integration by parts and successive integration, rectification of curves, quadrature of plane surfaces, surfaces and volumes of solids, centers of gravity of lines, surfaces and solids, and moments of inertia. Text-book, Hall's *Calculus*. Required of Engineering and Chemistry Sophomores. Second term. 4 hours.

13. DIFFERENTIAL CALCULUS.—Elective for Arts and Science Juniors and Seniors. Text-book, Hall's *Calculus*. First term. 3 hours.

14. INTEGRAL CALCULUS.—Elective for Arts and Science Juniors and Seniors. Text-book, Hall's *Calculus*. Second term. 3 hours.

15. DIFFERENTIAL EQUATIONS.—Elective for Arts and Science Seniors. First term. 3 hours.

16. THEORY OF FUNCTIONS.—Elective for Arts and Science Seniors. Second term. 3 hours.

17. DESCRIPTIVE ASTRONOMY.—Fundamental definitions, parallax, refraction, the earth, the sun, the moon, eclipses and the planets. Text-book, Young's *Astronomy*. Elective for Arts and Science Juniors and Seniors. First term. 3 hours.

18. PRACTICAL ASTRONOMY.—The use of the sextant in determining time by a single altitude of the sun, by a single altitude of a star, by equal altitudes of the sun, by equal altitudes of a star; in determining latitude by the meridian altitude of a star in any position and by circummeridian altitudes. The instrument constants of the transit instrument and its use in determining longitude. The use of the zenith telescope in determining latitude. Elective for Arts and Science Juniors and Seniors. Second term. 3 hours.

PHYSICS

Professor Gordon and Messrs. Lockwood, Eichlin and Bryan

Physics 1 and 2 are required for all Arts and Science students; Physics 3 and 4 are required for all Engineering and Chemistry students. Physics 6 is required for Electrical and Mechanical Engineering students.

Courses 7 to 12 and 18 are elective for Arts and Science students in either Junior or Senior year.

Applicants for honors in Physics take 7 to 12 and either 13 and 14, or 15 and 16.

1–2. GENERAL COURSE.—Including Light, Sound, Mechanics, Heat, and Electricity. Lectures, recitations and laboratory. Sophomore year. First and second terms. 4 hours.

3–4. GENERAL COURSE.—For engineering and chemistry students. Lectures, recitations and laboratory. First and second terms. Sophomore year. 4 hours.

6. ELECTRICAL MEASUREMENTS.—Required of students in Electrical and Mechanical Engineering courses. Laboratory. Sophomore year. Second term. 2 hours.

7. APPLIED ELECTRICITY.—Study of direct currents, including lamps and electric lighting, dynamos and motors, storage batteries, methods of measuring and testing. Recitations and laboratory. Junior or Senior year. First term. 3 hours.

8. APPLIED ELECTRICITY.—Study of alternating currents, including effects of inductance and capacity, alternating dynamos and motors, transformers, and electric waves. Recitations and laboratory. Junior or Senior year. Second term. 3 hours.

9. ELECTRO-CHEMISTRY.—Theories of electric cells and electrolytic conduction and practical applications. Recitations and laboratory. Junior or Senior year. First term. 3 hours.

10. RADIOACTIVITY AND X-RAYS.—Conduction through gases, radioactive transformations and X-Rays. Lectures, recitations and laboratory. Junior or Senior year. Second term. 3 hours.

11. OPTICS.—Study of lenses, spectrometers, interferometers and polarimeters. Recitations and laboratory. Junior or Senior year. First term. 3 hours.

12. RECENT ADVANCES IN PHYSICS.—Lectures with presentation and discussion of recent advanced work. Junior or Senior year. Second term. 3 hours.

13–14. MATHEMATICAL PHYSICS.—Applications of mathematics to Physics. Recitations and lectures. Senior year. First and second terms. 3 hours.

15–16. THESIS WORK.—Experimental study of special problems with a thesis giving the results of the experiments and discussion of relation of the work to that of others. Senior year. First and second terms. 3 hours.

18. THE TEACHING OF ELEMENTARY PHYSICS.—A review of elementary physics with discussion of methods of presentation. This course is intended for those who expect to teach the subject in High Schools. Junior or Senior year. Second term. 3 hours.

GROUP IV—ENGINEERING

CIVIL ENGINEERING

Professor Porter, Professor Lyle, Assistant Professor Spengler, Messrs. Williams and Johnston

The course in Civil Engineering has been designed to develop the mental faculties of the student in those studies which form the foundation of all branches of Technology with additional training in the subjects classed as Civil Engineering. The course also includes general subjects essential to a liberal education.

The graduate is prepared for immediate usefulness in the field and office, and, after a moderate amount of professional experience, to fill positions of trust and importance, not only in his chosen profession, but in allied work in mining, mechanical, electrical and architectural engineering.

The Department has a large equipment of instruments necessary for various branches of engineering field practice, including tapes, compasses, transits, levels, plane tables, barometers, standard base line tapes and pulling apparatus, sextants, solar attachments, chronometers, floats and current meters. A twelve-inch portable alt-azimuth instrument, reading to single seconds by micrometer microscopes, and provided with level for double zenith distances, is used for instruction in Geodesy and Practical Field Astronomy. A precision level of the latest design is employed in instruction in precise leveling.

The GENERAL TESTING LABORATORY contains one transverse machine of 400,000 pounds' capacity for specimens up to twenty-five feet in length and four feet in width, one 200,000-pound, three 100,000-pound screw testing machines and one 60,000-pound hydraulic testing machine arranged for tension, compression and transverse testing; a 4000-pound wire tester and a small machine for testing cord, twine, etc.; a 4000-pound transverse machine for specimens up to sixteen feet, and a small transverse machine for specimens up to five feet, arranged with micrometers for measuring deflections, and extension meters for measuring fiber deformations. The laboratory also contains a torsion machine of 125,000 inch-pounds' capacity for specimens up to twenty feet in length and a 10,000 inch-pound torsion machine of the pendulum type for short specimens; a number of elongation meters of different types, compressometers and smaller micrometers, hand tools, etc., and apparatus for calibrating machines. There are also a number of special apparatus for shearing, punching, bending, etc., tests.

The CEMENT LABORATORY is fully equipped for conducting routine tests of cement according to the latest specifications together with apparatus for research work. The laboratory contains three 1000-pound machines for tension tests and one 2000-pound machine for compression and tension tests. There is also a machine for moulding briquettes under pressure and a power-driven Boehme hammer, ball mill and an automatic sieving apparatus. Each student is provided with a slate top mixing table and with cement and sand boxes, moist closet and necessary hand tools. The laboratory is further equipped with large immersion tanks with running water, cement bins, briquette rack, moist closets and all necessary apparatus to enable a number of students to work on the same routine tests during the same laboratory period.

The CONCRETE LABORATORY has a large mixing floor; storage bins for stone, sand and cement; a concrete immersion tank to accommodate beams fifteen feet in length; a power driven cement mixer; a beam crane and trucks of two tons' capacity; beam, compression and tension moulds; sieves, scales, mixing pans, measures, shovels, etc.

The ROAD MATERIAL LABORATORY contains equipment for performing the abrasion and absorption tests on paving brick (the transverse test of paving brick being performed in the GENERAL TESTING LABORATORY), and equipment for the durability test of road metal.

This equipment consists of a brick rattler and a Deval abrasion machine, a drying oven, scales, immersion tanks, sieves, etc.

The HYDRAULIC LABORATORY contains a vertical pressure tank eighteen feet in height and five feet in diameter, arranged for making experiments on the flow of water through orifices and nozzles under heads up to three hundred feet, and provided with a device by which the orifice plates can be removed while the tank is under pressure; other smaller tanks for use under low heads; a standpipe sixty feet high; two tanks, thirty feet long for weir experiments and measurements of quantity; a turbine; impulse wheels; a centrifugal pump run by electric motor and provided with electric measuring instruments; rotary, disc and reciprocating water meters; a Venturi-meter; a weighing tank; absolute and differential pressure gauges; and other appliances for the measuring of water used in experiments and for the testing of meters, motors, nozzles and fire hydrants; as well as arrangements for lecture-room illustrations. There is also connected with the laboratory a one-million gallon Worthington duplex pump.

The MACHINE SHOP is under the direction of a skilled mechanic and contains two lathes, a drill press, a planer, a milling machine, a grinder and other necessary appliances for preparation of test specimens, moulds and apparatus, and for repair work.

2. PLANE SURVEYING.—Theory relating to the construction and use of instruments. Field problems in the manipulation and use of chain, compass, transit and level. Area computations. Methods of Plotting. Text-book—Breed and Hosmer's *Plane Surveying*. Second term, Freshman year. 2 credit hours. Asst. Professor Spengler and Mr. Williams.

2*a*. SUMMER SCHOOL.—Recitations and lectures on Surveying Methods and Adjustments of Instruments. Practice in the adjustments of instruments. Students are divided into squads of six men. Each squad, in charge of an instructor, makes a survey of an area whose perimeter is approximately five miles, including all topography, and a profile of the bounding roads of the traverse. Upon completion of all field work each student is required to plot a map and profile. Three weeks in vacation at end of Freshman year. $2^1/_2$ credit hours. Professors Spengler and Graves, Messrs. Williams, Johnston and Moore, and Summer 1916, Messrs. Holden (U. of P. '16), and Grigsby (Lafayette '16).

3. TOPOGRAPHIC SURVEYING.—Recitations and lectures on the principles involved and methods employed in the use of the transit

and stadia. Use of stadia slide rules, diagrams and tables. Determination of stadia constant. Surveys of portions of the college campus. Maps. Locating contours and cross sectioning with hand level. Contour problems. Text-books—Breed and Hosmer's *Surveying*, Vol. I. First term, Sophomore year. 2 credit hours. Asst. Professor Spengler.

4. RAILROADS.—Simple, Compound, Reversed, Vertical and Transition Curves. Problems. Turnouts, connecting Tracks and Crossings. Field Problems. Paper location of a railroad. Construction of the profile. Estimate of quantities. Text-book—Allen's *Railroad Curves and Earthwork.* Second term, Sophomore year. 2 credit hours. Asst. Professor Spengler.

4*a*. SUMMER SCHOOL.—Railroad surveying. Reconnaissance. Preliminary survey, Paper and Final Location. Determination of grades, slope staking, and cross sectioning. Drawing of map and profile of a line approximately two miles long is made.

Through the co-operation of the officials of one of the railroads with the Department of Civil Engineering all students are given a practical course in Railroad Maintenance, the Summer School schedule being so arranged as to give each student one week of Maintenance work. The remainder of each student's time is equally distributed through all phases of the Location work. Three weeks in vacation at end of Sophomore year. $2^1/_2$ credit hours. Professors Spengler and Hatch, and Summer 1916, Mr. Fry (Brooklyn Polytechnic Institute), and Messrs. Minshull and Meixell (L. V. R. R.).

5. RAILROADS.—Methods of computing earthwork. Construction and use of tables and diagrams. Problems. Completion of Summer School Map and Profile. Computation of earthwork from notes of Summer School Survey. Mass diagram. Determination of necessary right of way. Area computations. Economic location. Construction and operation. Problems. Text-books—Allen's *Railroad Curves and Earthwork.* Webb's *Railroad Construction.* First term, Junior year. 3 credit hours. Asst. Professor Spengler.

6. GEODESY.—Construction and use of precision instruments. Geodetic surveying methods. Triangulation, precise leveling and base-line measurements. Solar observations. Computations. Field work. Text-book—*Breed and Hosmer*, Vol. II. Second term, Junior year. 2 credit hours. Asst. Professor Spengler.

$6^1/_2$. APPLIED MECHANICS.—Statics. Definitions, Concurrent Forces, Parallel Forces, Center of Gravity, Couples, Non-Concurrent Forces, Moment of Inertia, Flexible Cords. Text-book—Riggs' *Hancock's Applied Mechanics for Engineers.* Second term, Sophomore year. 2 credit hours. Mr. Williams.

7. APPLIED MECHANICS.—Dynamics. Motion in a Straight Line, Curvilinear Motion, Rotary Motion, Work and Energy, Friction, Dynamics of Rigid Bodies, Impact. Text-book—Riggs' *Hancock's Applied Mechanics for Engineers.* First term, Junior year. 2 credit hours. Mr. Williams.

8. ROADS AND PAVEMENTS.—Location, construction and maintenance of town and country roads, city streets and pavements. Street cleaning. Text-book—Blanchard's *Elements of Highway Engineering.* Professor Lyle.

In addition to the above work, a total of four two-hour periods are devoted to the standard tests of paving brick and road metal. Mr. Williams. Second term, Junior year. 2 credit hours.

9. MECHANICS OF MATERIALS.—The principles of stress and strain; the behavior of materials under tension, compression and shearing; investigation and design of pipes, riveted joints, boilers and standpipes; strength and flexure of simple and cantilever beams. Report on the carrying capacity of a floor. Text-book—Merriman's *Mechanics of Materials.* First term, Junior year. 3 credit hours. Mr. Johnston.

10. MECHANICS OF MATERIALS.—Continuation of 9. Restrained and continuous beams; columns; shafts. Impact and fatigue; true and internal stresses; mathematical theory of elasticity. Design of an I-beam highway bridge and of a steel standpipe. Text-book—Merriman's *Mechanics of Materials.* Second term, Junior year. 3 credit hours. Mr. Johnston.

11. CEMENT AND CONCRETE.—Cement. The study of composition and method of manufacture of cement. Interpretation and method of performing different physical tests. Inspection and sampling of cement. Standard method of testing and specifications for cement. Text-book—Taylor's *Practical Cement Testing.*

CONCRETE—PROPORTIONING. Selection and preparation of materials. Mixing and placing concrete. Fire and rust protection. Waterproofing. Text-book—Taylor and Thompson's *Concrete, Plain and Reinforced.* First term, Junior year. 2 credit hours. Mr. Williams. For laboratory work see 31*b*.

12. MASONRY.—Classification and properties of stone, building brick, common and hydraulic lime, sand, gravel and broken stone. Stonecutting, stone and brick masonry. Ordinary and pile foundations. Foundations under water. Retaining walls, bridge abutments, bridge piers and culverts. Text-book—Baker's *Masonry*. Second term, Junior year. 2 credit hours. Mr. Williams.

13. MASONRY DESIGN.—Design of a high masonry dam, a masonry arch and a reinforced concrete culvert. Notes. First term, Senior year. 2 credit hours. Professor Lyle.

14. FRAMED STRUCTURES.—The theory and computation of stresses in simple roof and bridge trusses and towers, under dead, live and wind loads. Notes. Second term, Junior year. 2 credit hours. Professor Porter.

15. FRAMED STRUCTURES.—Continuation of 14. Railroad bridges under locomotive wheel, excess and equivalent loads. Stress sheets. Complete computations and design drawing for a wooden roof truss with bill of materials and estimate of cost. Complete computations and design drawing of a plate girder for railroad purposes, in accordance with standard specifications. Bill of materials, weights and estimate of cost. Text-book—*Merriman and Jacoby*, Part I, and notes. First term, Senior year. 6 credit hours. Professor Porter.

15*a*. FRAMED STRUCTURES.—Same as 14, given to Mechanical Engineers only. Mr. Johnston. First term, Senior year. 2 credit hours.

16. FRAMED STRUCTURES.—The theory and computation of the stresses in continuous, partially continuous, draw and cantilever trusses, suspension bridges and arches. Complete computations and design drawing of a through pin connected railroad bridge in accordance with standard specifications. Bill of materials, weights and estimate of cost. Second term, Senior year. 6 credit hours. Professor Porter.

17. SEWERAGE.—The disposal of sewage and garbage. The determination of the size and capacity of sewers, inlets and flush tanks. Construction methods. Text-book—Folwell's *Sewerage*. First term, Senior year. 2 credit hours. Professor Lyle.

18. SEWERAGE DESIGN.—Design of a sewer system for a small city with map and profiles. Notes. Second term, Senior year. 2 credit hours. Professor Lyle.

20. HYDRAULICS.—Hydrostatics, hydraulic instruments, orifices, weirs and tubes. Text-book—Merriman's *Hydraulics*.

In addition to the above, a total of five two-hour periods are devoted to tests on the circular orifice, the Venturi-meter, water meters and weirs. Second term, Junior year. 2 credit hours. Civil Engineers only. Professor Lyle.

21. HYDRAULICS.—Continuation of 20. Pipes, conduits; rivers; water power; dynamics; overshot, undershot and breast wheels; impulse wheels; turbines. Text-book—Merriman's *Hydraulics*. First term, Senior year. 2 credit hours. Civil Engineers only. Professor Lyle.

23. HYDRAULICS.—Same as 20 for Ch.E., M.E., E.M. & E.E. First term, Senior year. 2 credit hours. Professor Lyle.

24. HYDRAULICS.—Same as 21 for Ch.E., M.E., E.M. & E.E. Second term, Senior year. 2 credit hours. Professor Lyle.

25. WATER SUPPLY.—The requisites for a good water; the available sources of supply; the construction of pumping plant, reservoirs and pipe lines; purification of water and its distribution to the public. Text-book—Turneaure and Russell's *Public Water Supplies*. First term, Senior year. 2 credit hours. Professor Lyle.

26. WATER SUPPLY DESIGN.—Design of a water supply system for a small city. Notes. Second term, Senior year. 1 credit hour. Professor Lyle.

27. REINFORCED CONCRETE.—The theory and design of slabs, beams, girders, columns, and other forms of construction. Text-book—Taylor and Thompson's *Concrete, Plain and Reinforced*.

In addition to the above work a total of two three-hour laboratory periods are devoted to tests of specimens prepared in 31*b*. Tests are made on plain concrete specimens to determine the stress deformation curve and modulus of elasticity in tension and compression. Tests of reinforced concrete beams also are made to determine deflection, fibre stress distribution, location of neutral axis, and for comparison of actual results with those given by various formulas. First term, Senior year. 2 credit hours. Mr. Williams.

29. GENERAL TESTING LABORATORY.—Study and use of testing machines. Commercial tension tests of iron and steel. Modulus of elasticity in tension and compression. Shear tests of iron and steel. First term, Junior year. 1 credit hour. Mr. Johnston.

30. GENERAL TESTING LABORATORY.—Continuation of 29. Transverse tests of cast iron and wood; modulus of elasticity of steel in bending; tests of wooden columns; torsion tests of iron

and steel; calibration of testing machines. Second term, Junior year. 1 credit hour. Mr. Johnston.

31*a*. LABORATORY CEMENT.—Routine tests of Portland cements are made in accordance with the standard methods and specifications, the aim being to have the student become thoroughly acquainted with each standard test and to appreciate the significance of the results obtained. Special tests are also assigned to each student. Notes. First term, Junior year. $^1/_2$ credit hour. Mr. Williams.

31*b*. LABORATORY, CONCRETE.—Mechanical analysis of the materials for concrete, proportioning and mixing; preparation of plain and reinforced concrete specimens for future tests. Notes. First term, Junior year. $^1/_2$ credit hour. Mr. Williams.

36. THESIS.—A thesis is required of every student as a condition of graduation, upon a subject appropriate to and approved by the Department. All laboratories and other apparatus belonging to the Department may be used for thesis purposes. Second term, Senior year. 1 credit hour. Professor Porter.

ELECTRICAL ENGINEERING

Professor Rood and Assistant Professor Tanzer

The object of the course in Electrical Engineering is to give thoro instruction in such branches of engineering, both general and electrical, as shall fit the graduate to successfully meet and solve the problems which come to him as practicing electrical engineer. To this end, stress is laid on the attainment of a broad engineering and scientific training rather than on the specialization along any particular line or lines of Electrical Engineering.

Beginning with the second term of the Sophomore year, the fundamental principles of Electrical Engineering are studied in the class room and worked out in the laboratory, the design room, and in problem work.

In Senior year attention is being paid to the direct application of the theories and principles thus arrived at, to the various phases of present-day commercial practice, consideration being given to the financial and commercial as well as the engineering side.

The graduate is in this way prepared to take up in an effective and intelligent manner any branch of electrical engineering requiring general or special electrical training.

The main electrical laboratory is thirty by sixty feet in dimensions, and is fitted up with representative types of continuous and alternating current generators and motors, lamp-banks, water rheostats, brakes, etc.; and the necessary instruments are supplied for loading and testing generators and motors.

The laboratories are supplied from the Easton Power Company's station, with two-phase, alternating current, at a frequency of sixty cycles. This current is available for testing purposes.

A fifty kilowatt motor-generator set has been installed for the purpose of supplying the laboratories with direct current. This set consists of a seventy-five horse power induction motor, directly connected to two twenty-five kilowatt, 120-volt direct current dynamos, the current from which is supplied to the laboratories by means of the three-wire system.

In case of need, direct current from the plant of the Easton Power Company is also available.

While designed primarily as a source of direct current, this motor-generator set is so installed as to be available at all times for experimental tests by the students.

A portion of the laboratories is fitted up for the more delicate tests required with the necessary instruments for accurate testing, among which are a Leeds and Northrup Potentiometer, a Thompson Quadrant Electrometer, D'Arsonval Galvanometers, Wheatstone bridges, condensers, etc. Particular attention is paid to photometry of electrical illuminants and specially fitted rooms have been provided for this work.

1. DIRECT AND ALTERNATING CURRENT ENGINEERING.—A study of direct and alternating current circuits, apparatus and systems. First term. Junior year. 5 hours.

2. DIRECT AND ALTERNATING CURRENT ENGINEERING.—A continuation of the work of the first term. Second term. Junior year. 5 hours.

3-4. ELECTRICAL LABORATORY.—A course in general electrical engineering testing. Throughout the Junior year. 2 hours.

5. ELEMENTS OF ELECTRICAL ENGINEERING.—An introductory study of direct and alternating current circuits, systems and apparatus. First term. Junior year. 2 hours.

6. MOTOR AND ILLUMINATING ENGINEERING.—A study of the application of electrical energy to motor and illuminating engineering. Second term. Junior year. 3 hours.

7–8. Electrical Laboratory.—A continuation of Courses 3 and 4, covering advanced electrical engineering testing. Thruout Senior year. 2 hours.

9–10. Electrical Laboratory.—A shorter course in electrical engineering testing. Thruout Junior year. 1 hour.

11*a*. Electric Power Transmission.—A study of electrical transmission and distributing circuits and systems. First term. Senior year. Required of Senior Electricals. 5 hours.

11*b*. Electric Power Transmission.—A study of electric transmission and distributing circuits and systems. First term. Senior year. Required of Senior Mechanicals. 3 hours.

13. Electrical Design.—The design of direct and alternating current apparatus. First term. Senior year. 2 hours.

15. Electric Railway Engineering.—The engineering and economics of railway construction and operation. First term. Senior year. 4 hours.

16*a*. Electric Power Plant Engineering.—The study of the conditions affecting the design, erection and operation of electric power plants and substations. Second term. Senior year. Required of Senior Electricals. 5 hours.

16*b*. Electric Power Plant Engineering.—The study of the conditions affecting the design, erection and operation of electric power plants and substations. Second term. Senior year. Required of Senior Mechanicals. 2 hours.

21–22. Engineering Abstracts.—The review and discussion of articles and papers of value in current engineering literature. Thruout Junior and Senior years. 1 hour.

24. Thesis Work.—A thesis is required of every student as a condition of graduation, the topic being assigned or approved by the head of the Department. The thesis must show the result of individual investigation and research. Second term. Senior year. 2 hours.

MECHANICAL ENGINEERING

Professor Fitch, Messrs. Pearce, Wallaesa and Flowers

Two courses are offered in Mechanical Engineering, the Co-operative course, and the regular four-year course. The object of these courses is to give the student-engineer a broad education and to equip him to handle engineering problems. Particular attention is given to the association of theory with practice, and as much time as possible is given in the illustration of good engineering practice in the various works of the Lehigh Valley region. More opportunity is offered in the Co-operative course for practical training, but the theoretical work is identical for the two courses.

The successful completion of these courses leads to the degree of Bachelor of Science in Mechanical Engineering.

THE CO-OPERATIVE COURSE IN MECHANICAL ENGINEERING

The Co-operative Course in Mechanical Engineering aims to accomplish these three objects: First, to give the students a broad foundation for life; second, to teach engineering principles; third, to give the student actual experience in the application of these principles in commercial practice, by his employment in well-equipped engineering works, and so supplement his technical education and prepare him for the practice of his profession upon graduation. The joint contribution made by the engineering works and the college gives the term "Co-operative" to this course.

To accomplish these three objects, the course is arranged as follows:

FRESHMAN AND SOPHOMORE YEARS

Freshman and Sophomore years remain the same as for the students taking the regular engineering courses. Mathematics, Physics and Chemistry, English and Modern Languages, compose most of the work of these years.

At the end of Sophomore year, in June, those students electing the Co-operative Course are placed in carefully selected works of the Lehigh Valley region, as student-apprentices, where they are employed and perform work assigned by the Management, and receive compensation for their labor. An officer of instruction of the college watches carefully the progress of each student-apprentice, and confers with the Management, so that each man may be placed in that line of work for which his natural ability and temperament are best suited. This is the "trial" period, in fact, the period which every student must pass through, and a great advantage of this course is that this period comes early in his career, and under the helpful guidance of his adviser at college and the Management of the works. Usually this "trial" period comes after graduation, when there is great disappointment if the graduate realizes for the first time that his chosen profession is not the one which he can follow. If he could have had this experience earlier, he could have easily changed to a course more suited to his abilities and temperament.

JUNIOR, SENIOR, AND FIFTH YEARS

After a short vacation at the end of the summer between Sophomore and Junior years, the student returns to college and finds the following: The students are grouped in squads of two men each. One man spends the first two weeks in classrooms, the other man the first two weeks as an employee at a plant. At the end of two weeks the two change places. Each man thus spends alternate fortnights in classroom and plant through the year. This plan is followed for three years, with the exception of a short vacation each Christmas and two weeks each summer. The entire course is thus completed in four years and nine months. The same amount of collegiate work is covered as in the regular engineering courses, and in addition to this there are seventy-two weeks of practical work in the plants, for which the student receives compensation, according to the rates of pay for the work on which he is employed. The earnings will increase with the experience but in any event should more than cover the fees payable to the college.

It may be pointed out that the amount of strenuous shop routine while apparently large is no more than present economic conditions require in the training of an engineer. The young engineer, in any case, would have to go through this period of hard, practical work, and it is a great advantage to be able to have this experience earlier in life, and during an impressionable age, when youth and activity will aid him in adapting himself to industrial conditions.

The employment at the works comes at a time when the student is taking up the study of engineering subjects at college, and the student is closely in touch with the application of the principles of engineering in the works.

Another great advantage of this course which must not be passed unnoticed, is that the student's employment in the works in competition with men cultivates the habit of industry, which is reflected very strongly in his work at the college in the added zest and interest which he shows.

Co-operative students are required to obey all the rules of the works where they are employed, and are subject to all the laws governing labor, including those pertaining to liability for accident.

EQUIPMENT

The new Shop and Steam Laboratory is 102 feet wide, 183 feet long, and 40 feet from floor to peak of roof, and is constructed entirely of concrete, steel, brick, and glass, making a light, airy building, absolutely fireproof. Two partitions 8 feet high extend down the center of the large room, forming a passageway, to the left of which is the pattern and machine shop, and to the right the steam laboratory and instructors' offices. At the back of these are the forge shop, the foundry, and the boiler room, connected with each of which is a storage room for the material to be used, and a coal bunker. A large toilet room, supplied with hot and cold water and fitted with individual lockers, is provided in the basement for the convenience of the students.

The pattern shop is completely equipped with benches, lathes, hand saw, circular saw, planer, etc., and all the accessories necessary in an efficient shop.

The foundry is supplied with a cupola, a soft metal furnace, a core oven, ladles, flasks, and all tools necessary to make moulds and turn out practical castings in brass or iron.

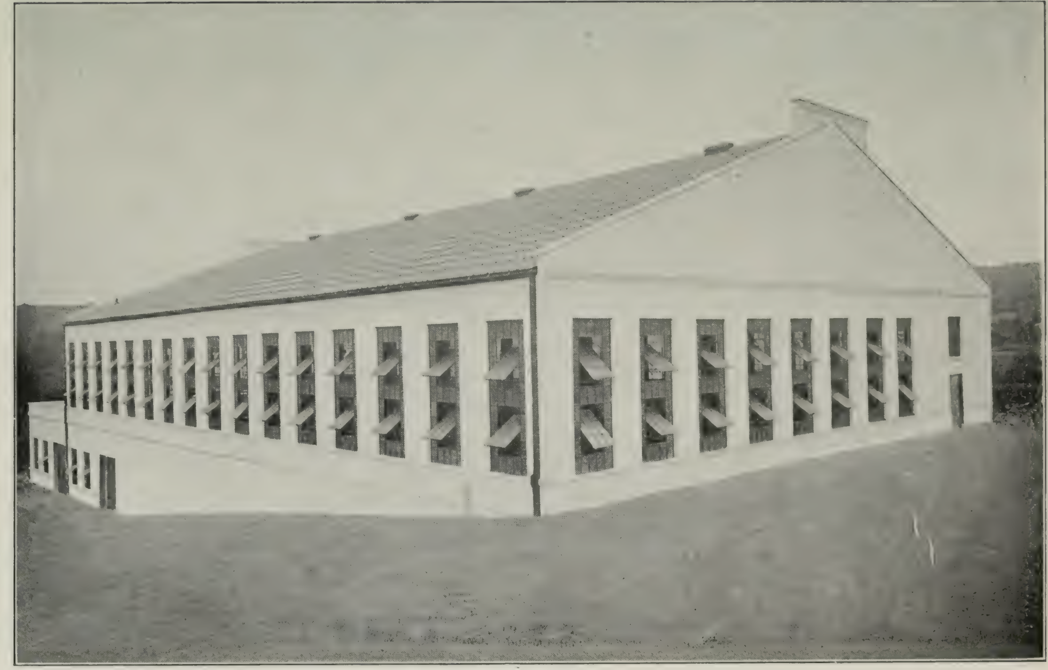
The forge shop is equipped with student forges, all of the downdraft type, and a gas forge, anvils, and all of the tools used for the shaping and welding of metals by this process.

In connection with the forge shop there is a sheet metal and pipe shop equipped with the necessary tools to give instruction in sheet metal and pipe work.

The machine shop is fully equipped with vise benches for hand work, lathes, planers, shapers, milling machines, drill presses, power saw grinding machine, and all small tools to go with each of the machines. All are motor-driven, and direct-connected wherever possible, making a light shop, eliminating the danger of belts, and also furnishing a convenient means for testing any of the machines, or tools of various makes of steel, under different conditions of operation. The gears are encased to give greater safety to the operator.

All of the equipment is of full pactical size of standard make, most modern design, and of a type that offers the greatest educational advantages. Every care has been taken to make all of the equipment as safe as possible for the inexperienced student. Certain machines may be used only under the direct supervision of an instructor.

The pumping station of the Peoples' Water Company of Phillipsburg, New Jersey, is used as a testing laboratory. This is a modern station equipped with four 130 H. P. return tubular boilers and a six-million gallon Allis-Chalmers triple expansion pumping engine with all auxiliaries. It also has an auxiliary pumping unit of six million gallons' capacity which is steam turbine driven. This station is completely equipped for plant testing, and is one of the finest plants of its kind in the country. Exercises carried on here are under commercial condi-



MECHANICAL ENGINEERING LABORATORY AND SHOP.

tions and are more valuable to the student than if carried on in an experimental laboratory where conditions are not real.

2a. SHOP.—An elective course in practical work in Machine Shop Practice, Forging, Sheet Metal and Pipe Work. This course is offered as a summer course of three weeks, eight hours per day.

3–4. SHOP.—An elementary course in practical work. Pattern Making: Use and care of tools, a study of the properties of the materials used, relation of pattern making to moulding; a study of solid and hollow castings and the construction of their patterns. Frequent visits to the foundry are made, so that the student may become familiar with the use of patterns there. Foundry practice: Tempering and mixing of moulding sands, the use and care of tools and equipment, pyrometry, green sand, loam, and dry moulds; multiple production, management of cupola, and care of ladles; use of chills. Castings in iron, semi-steel, brass, and white metal. First and Second terms, Sophomore year, 6 hours' practical work.

5*c*–6*c*. HEAT ENGINEERING.—A detailed study of the principles
7*c*–8*c*. of thermodynamics; properties of gases, saturated and superheated vapors, flow of fluids, the study of the various cycles of internal combustion, and steam engines, of steam turbines, air compressors and refrigeration systems. A study and discussion of the different types of simple and multiple expansion steam engines, their valve gears, governors, and auxiliaries; also steam boilers, injectors, pumps, and auxiliaries. The theoretical work of the course is accompanied with graded engineering problems, which the student is called upon to solve. Many of these problems are based on reliable data from actual tests. Opportunity is offered for actual plant and engine tests at several industrial plants of the Lehigh Valley. Lectures and recitations throughout Junior, Senior and Fifth years, 3 and 4 hours, Co-operative course.

5–6. HEAT ENGINEERING.—Same as 5*c*, 6*c*, 7*c*, 8*c*. Junior and
7–8. Senior years. 3 hours. Regular course.

9–10. HEAT ENGINEERING.—An elementary course of lectures, and laboratory quizzes, problems, three periods per week, throughout Junior or Senior years, on Steam Engines, Steam Turbines, Internal Combustion Engines, and the Principles of Thermodynamics. 3 hours. (Electrical, Mining and Chemical Engineers.)

11*c*–12*c*. MACHINE DESIGN.—A study of the motion of machines, the design of gearing, of simple machines, power transmission; a study of the action of reciprocating parts, and fly-wheels. Lectures and drawing periods, Second term Senior, and first and second terms Fifth years, 9 and 12 hours, Co-operative course.

11–12. MACHINE DESIGN.—Same as 11*c*, 12*c*. Senior year, 9 hours. Regular Course.

14*c*. INDUSTRIAL MANAGEMENT.—Historical outline, effect of inventions, modern tendencies, industrial ownership, principles of industrial organization, cost-keeping, depreciation, compensation of labor, purchasing and inspection of materials, location of plants. A series of lectures by successful men on various subjects pertaining to Industrial Management will be given, in addition to the regular classroom work. Lectures and recitations, Second term, Fifth year, 4 hours, Co-operative course.

14. INDUSTRIAL MANAGEMENT.—Same as 14*c*. Second term, Senior year, 2 hours, Regular course.

15–16. STEAM BOILERS.—A course of lectures, quizzes and laboratory exercises on different types of boilers and accessories, fuels, combustion, strength and design of boilers. 3 hours, First term, 3 hours for 3 weeks, Second term, Junior year, Regular course.

18. THESIS.—A thesis is required of every student as a condition of graduation. The subject may be chosen by the student and must be approved by the Department. Regular course.

20. MECHANISM.—A course of recitations and drawing periods on the study of the motion of machines, kinematics, gearing, etc. 3 hours for 14 weeks. Second term, Junior year. Regular course.

21*c*. APPLIED MECHANICS.—Statics, Forces, Equivalence of force systems, centroids, general principles of equilibrium and application of the principles of equilibrium. Kinematics. Rectilinear and curvilinear motion, motion of a rigid body. Kinetics. Motion of a particle, and of a system of particles, translation of a rigid body, rotation, work and energy. First and Second terms, Junior year; Summer and First terms, Senior year. 3 hours. Co-operative course.

25*c*. MECHANICS OF MATERIALS.—The principles of stress and strain; the behavior of materials under tension, compression and shearing; investigation and design of pipes, riveted joints, boilers and standpipes; strength and flexure of simple and cantilever beams. Report on the carrying capacity of a floor. First and Second terms, Junior year. 3 hours. Co-operative course.

26*c*. MECHANICS OF MATERIALS.—Continuations of 25*c*. Restrained and continuous beams; columns; shafts. Impact and fatigue;

true and internal stresses; mathematical theory of elasticity. Design of an I-beam highway bridge and of a steel standpipe. Summer and First terms, Senior year. 3 hours. Co-operative course.

MINING ENGINEERING

Professor Marquard

The course leading to the degree of Bachelor of Science in Mining Engineering (B.S. in E.M.), Engineer of Mines (E.M.) is intended to give a general engineering education and to prepare men for positions of responsibility in mining, metallurgy and general engineering. The policy of the Mining Department is to give thoro training in the underlying principles of mathematics, physics, chemistry, mineralogy, geology, metallurgy, surveying, mining engineering, and some practical knowledge in mechanical, civil and electrical engineering. With this fundamental training the mining graduates can successfully carry on specialized work and be rapidly advanced to positions of responsibility.

The training in geology consists of the study of mineralogy, crystallography, petrography, general and economic geology, and the geology of ore deposits.

The course in chemistry consists of lectures, recitations and laboratory work in inorganic chemistry, qualitative, quantitative and metallurgical analysis, blow-piping and assaying.

The study of mining proper consists of courses given in the Junior and Senior years and includes: mine surveying and problems, deep boring, blasting, quarrying, shaft-sinking, drifting, tunneling, methods of mining and timbering, haulage, winding, ventilation, drainage, mining laws, mine and mill construction, ore dressing, metallurgy and mine machinery.

The milling laboratory is a model concentrating plant that is fully equipped to crush, classify, separate and concentrate ores. The equipment consists of a Blake crusher, Cornish rolls, elevators, centrifugal pump, trommels, hydraulic classifiers, spitzkastens, a Wilfley shaking table, a slime table, New Century jigs, and a motor to supply power.

All students in the mining course are required to take the three weeks' Summer school of surveying at end of Freshman year.

One week in the Spring vacation of Junior and Senior years is spent in an actual mine survey, and in inspecting and studying the practical mining operations. Students are strongly advised to spend at least one Summer vacation during their course in actual work at the mines.

1. Mine Structures.—Methods of shaft, drift and square set timbering and design of flumes, trestles and roof trusses. First term, Senior year. 2 hours.
2. Mine Structures.—Design of head-frames and retaining walls. Second term, Senior year. 2 hours.
3. Mine Exploitation.—Methods of development and working coal and metalliferous mines. First term, Senior year. 2 hours.
4. Ore Dressing.—Principles and machinery used in the mechanical concentration of ores. Second term, Senior year. 3 hours.
5. Mine Machinery.—Theory of air compression and study of machines used in coal and metal mines. First term, Senior year. 2 hours.
6. Shaft Sinking.—Methods of shaft sinking, drifting, tunneling, boring and blasting. Second term, Senior year. 2 hours.
8. Ventilation.—Study of air in mines with methods of ventilation and lighting. Second term, Senior year. 2 hours.
10. Mining Law.—Mining and mineral laws of U. S. Second term, Senior year. 2 hours.
11. Mine Surveying.—Theory and problems in mine surveying. Second term, Junior year. 2 hours.
12. Haulage and Drainage.—Theory and problems in hauling, hoisting and mine drainage. Second term, Junior year. 2 hours.
14. Thesis.—A graduating thesis is required of each candidate for a degree. This thesis must be an original design or review of some process, machinery or plant related to mining operations. The subject of the thesis is assigned by the department along lines of special interest to the student. Second term, Senior year. 2 hours.

PHYSICAL TRAINING AND HYGIENE

Director Bruce and Professor Kunkel

Physical Training.—The work of this department is carried on in the gymnasium, and physical training is required of all students of the Freshman Class, First and Second terms, beginning the first Thursday of November. 4 hours.

SYSTEM

The course in physical training embraces educational gymnastics, systematic bodily exercises based on scientific principles and founded on physiological rules.

ANTHROPOMETRY AND PHYSICAL DIAGNOSIS

The student before entering on the course must present himself to the Director for a physical examination. By means of this examination the physical condition of the individual is ascertained. The relative proportions of the parts of the body; the undue development of some muscles and the relaxed and enfeebled condition of others; the comparative size of body and limbs; variations of height, breadth, weight, and muscular strength from the normal standard of a given age are all taken into account in prescribing the course of training. The results of this examination are plotted on anthropometric charts and directions given in booklet form for developing the various parts of the body and correcting individual defects. At the end of the course a second examination is made and the results plotted on the same charts, thus showing the student his exact physical improvement.

OPTIONAL COURSES

Optional courses are offered to upper classmen in advanced gymnastics and instruction in the science of fencing, boxing, and of wrestling.

In connection with this course a series of indoor games are introduced. The gymnasium is equipped with regulation handball courts and a series of tournaments are held during the second term.

Outdoor exercise is encouraged and cross-country running in a mild form is promoted for the benefit of students who are not members of athletic teams.

PERSONAL HYGIENE.—A course of four lectures required of all Freshmen at the beginning of the first term. It is intended in these lectures to acquaint the student with the physiology and hygiene of the reproductive organs, and to warn him of the results of a wrong attitude toward the sexual life. Professor KUNKEL

FEES AND EXPENSES

Tuition per year, Divisions I, II, and III	$100.00
Divisions IV and V (Engineering, Chemistry, and Pre-medical)	150.00
Incidental Fee for upkeep of grounds and buildings per year.	25.00
Library Fee per year	15.00
Gymnasium Fee per year	5.00
Student Activities Fee, including membership in Athletic Association, admission to games, subscription to the Lafayette, etc., per year	10.00
Matriculation Fee (paid once only)	10.00
Graduation and Diploma Fee (paid once only)	10.00
Damage Deposit, per year, balance not used to offset public damage returned to student	2.00
Laboratory Fees for Material in Laboratory Courses, paid only by students taking laboratory courses:	
Biology, each laboratory course per term	3.50
Chemistry, each laboratory hour per week per term	1.50
Geology, each laboratory course per term	3.00
Civil Engineering Fee, per term	4.00
Mechanical Engineering Shop, per term	12.50
Physics, each laboratory course per term	5.00
General Testing Laboratory, per term	4.00
Electrical Engineering Laboratory, per term	7.50
Cement Laboratory, per term	1.00
Graphics, Material Fee, per term	0.50
Fee for Summer Course in Surveying	10.00
Thesis and Diploma Fee for Degree of C.E., M.E., E.E., E.M., Chem.E., after 1919	25.00

CO-OPERATIVE COURSE IN MECHANICAL ENGINEERING

JUNIOR, SENIOR AND FIFTH YEARS

Tuition per quarter, payable September 15th, December 15th, March 15th, and June 15th (Total eleven quarters), includes all Fees, except Graduation, Laboratory and Matriculation (for students entering during these years)	40.00
Graduation and Diploma Fee (paid once)	10.00
Biology, each Laboratory course, per term	2.00
General Testing Laboratory, per term	2.00
Electrical Engineering, Laboratory, per term	1.75

All fees are to be paid to the Bursar, at the college office. Checks should be made payable to "Lafayette College."

The entire incidental, gymnasium and damage fees and one-half the tuition and other charges are due and payable at the beginning of the first term. Ten per cent penalty will be added to all bills not paid by October first. The balance of fees is due and payable at the beginning of the second term. Ten per cent penalty will be added to all bills not paid by March first. The matriculation fee is due upon filing certificate for admission.

Students entering after the middle of the term shall pay one-half of the tuition for the term. Students obliged on account of sickness to leave before the middle of the term may have refunded to them one-half of the tuition for the term; no reduction will be made to those leaving for any other cause.

Graduate students will be charged at the rate of ten dollars per hour per year with a minimum total charge of $150 for the degree of Master of Arts or Master of Science, exclusive of laboratory charges for material. Graduate students do not pay other fees except Diploma Fee.

ANNUAL EXPENSES

Some money for books and other incidental expenses will be needed, but, with close economy, the total annual expenses—exclusive of clothing, traveling expenses and laboratory fees—need not exceed $400, as will be seen from the following summary:

	Liberal	Moderate	Minimum
Incidental fee	$ 25.00	$ 25.00	$ 25.00
Charge for College reading-rooms, gymnasium, etc	20.00	20.00	20.00
Student activities fee	10.00	10.00	10.00
Board, 36 weeks, at $4.00 to $5.00	180.00	160.00	144.00
Rent of College-room, $24 to $99	99.00	49.00	24.00
Light and fuel	21.00	21.00	21.00
Washing	25.00	16.00	12.00
Books and stationery	48.00	40.00	20.00
	$428.00	$341.00	$276.00

Add tuition of $100 or $150 according to course of study.

Laboratory fees and damage assessments, which vary in amount, must also be added, while the personal expenses for clothing, etc., must be estimated according to individual experience. The first year will be made more expensive by the fee for matriculation, and furnishings for room. It is strongly recommended that parents furnish their sons with little beyond what will meet their necessary expenses.

SCHOLARSHIPS

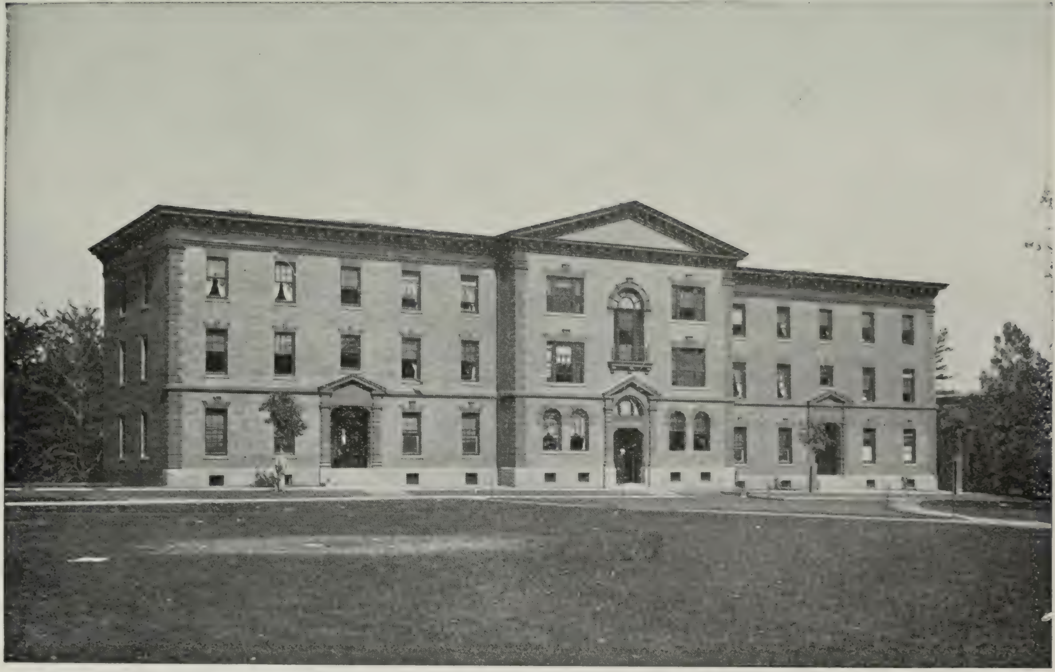
ENDOWED SCHOLARSHIPS

ANDREW M. LOWRY SCHOLARSHIP.—This scholarship was founded by a bequest of twenty-five hundred dollars, the income to be used for the benefit of young men studying for the gospel ministry.

MARY ELL APPLEY FREE SCHOLARSHIP FUND.—Founded by a bequest of twenty-one thousand three hundred dollars from Mrs. Luther Appley of Honesdale, Pa. The income to be used "in defraying the legitimate college expenses or so much thereof as in the opinion of the Trustees shall be for the best interests of the recipients, of poor deserving young men, residents of the Commonwealth of Pennsylvania, in attendance upon Lafayette College, as may be fitting themselves for the Christian ministry or the practice of medicine not exceeding three hundred dollars ($300.00) a year to each student." "These advancements to needy, deserving students to be received, retained and used by the recipients as a debt to honor, and whenever thereafter, in the practice of their several professions or otherwise, he shall be in receipt of an income more than sufficient to comfortably maintain himself and those legitimately dependent upon him, then to return annually thereafter without interest, such a part of the sum as each can do until the entire amount thus received has been returned to the Trustees aforesaid." At the time of making each advancement the Trustees shall take from each recipient a receipt therefore showing fully the amount received and the terms of the bequest.

CLASS OF 1880 SCHOLARSHIP.—Established June, 1902, by the gift of two thousand one hundred and twenty-five dollars from members of the Class of 1880, the income to be applied to tuition.

H. B. SILLIMAN SCHOLARSHIP.—The income of $1000 held in trust by the College Board is to be applied on the tuition "of some male student who is a member of an Evangelical church, to be selected by the faculty for good scholarship, and active Christian influence. With prospect of future usefulness, and under such other conditions as the faculty shall determine."



MARTIEN, FAYERWEATHER AND POWELL HALLS.

W. J. McCAHAN SCHOLARSHIP.—Established in 1907 by a gift of two thousand dollars, the income to be applied to tuition.

JOHN H. CONVERSE SCHOLARSHIP.—Established in 1908 by a gift of two thousand dollars from the late John H. Converse of Philadelphia. The income to be awarded to a "young man studying for the Christian ministry, without reference to denomination."

GEORGE E. STERRY SCHOLARSHIP.—Established by the gift of two thousand dollars from the late George E. Sterry. The income to be applied to tuition.

MAITLAND ALEXANDER SCHOLARSHIP.—Established Dec. 31, 1908, by the gift of two thousand dollars from Rev. Maitland Alexander, D.D., of Pittsburgh. The income to be applied to tuition.

EDWARD COLEMAN FREEMAN SCHOLARSHIP.—Established April 30, 1913, by the gift of fifteen hundred dollars each from Isabel G. Freeman and Margaret C. Buckingham, in memory of Edward Coleman Freeman of the Class of 1879. The income to be applied to tuition.

HENRY L. DAVIS SCHOLARSHIP.—Established (1914) by the gift of one thousand dollars.

THE ARIO PARDEE SCHOLARSHIPS.—Established 1916 by the gift of twenty thousand dollars by Mr. I. P. Pardee of Hazleton, Pa. One scholarship to be awarded each year to a member of the graduating class of the Hazleton High School upon the joint recommendation of the Superintendent of the Hazleton schools, and any graduates of Lafayette College employed as teachers in the Hazleton schools, subject to confirmation by the Lafayette College faculty or president.

TRUSTEES SCHOLARSHIPS

Aid in the form of scholarship loans repayable in installments beginning five years after graduation is given to a limited number of young men of ability, industry and character, who would otherwise be unable to secure a college education. The amount of aid will depend upon the necessities of the applicant, but in no case will exceed the charge of tuition for students in Divisions I and II, nor half the charge for tuition for students in Civil Engineering, Electrical Engineering or Mining Engineering. No aid is available for students in Divisions III or V, nor for students in Mechanical Engineering.

Scholarships offered as prizes in certain schools will be under the same regulations as other aid. The perpetual scholarships issued to individuals prior to the establishment of the Scientific Department will provide free tuition in Divisions I and III and one-half tuition in the Technical Courses.

ROOMS AND BOARD

Unfurnished rooms in the College Dormitories, South Hall, East Hall, Blair, Fayerweather, Knox, Martien, McKeen, Newkirk and Powell rent for $24 to $144 a year for one or two persons. The additional charge for electric light is $9 per year and for steam heat $12 per year for each person. Applications for rooms should be made to the Superintendent of Grounds and Buildings, Albert M. Lane, at the College Office. Students are expected to room in the dormitories unless permission is granted to room elsewhere. Special arrangements will be made for students of the co-operative course wishing to retain their rooms throughout the year.

There are also thirteen fraternity houses on or near the college campus with rooms for about 200 students.

The college does not conduct a college commons or dining hall but furnishes facilities for eating clubs in the college dormitories. Board in these clubs, in boarding houses and in restaurants in the immediate vicinity of the campus, and in fraternity houses, may be secured at $4.25 to $5 a week.

MEDICAL TREATMENT

A college physician has been provided for the benefit of the students and for the information of the college authorities and the parents of students in the case of serious sickness. The physician is John Edgar Fretz, M.D.

The regulations with regard to this attendance upon students are as follows:

The college physician shall make one call for diagnosis and prescription at the request and expense of the College. When called to see students he shall make a report of the diagnosis, with a recommendation of the course to be followed, to the Dean within twenty-four hours.

For continued attendance students may make their own arrangements with the college physician or some other physician approved by the college authorities. All calls after the call for diagnosis and all office calls shall be at the expense of the students.

When hospital treatment is required students will be cared for at the Easton Hospital unless otherwise directed by their parents or guardian.

BUILDINGS

The college grounds are situated upon the summit of a beautiful hill, overlooking the city of Easton. They are reached by a flight of stone steps, which ascend the bold front of the hill directly from the head of Third Street, or by electric cars, which skirt the face of the hill by a gradual incline. At the head of the steps stands the monument erected by the alumni association to their comrades who "died for the Union." The grounds contain about sixty acres terraced and laid out under the direction of Donald G. Mitchell. The buildings upon the campus are forty-two in number. The oldest of these is

SOUTH COLLEGE

The central portion of this building was erected in 1833 and was the original college building. At later periods east and west wings were added and the whole building was thoroughly overhauled and modernized in 1909. It now contains a large part of the class and lecture rooms for the academic department, and the basement and first floor of the east wing have been fitted for a lecture-room and laboratory for the Department of Mining Engineering.

The first and second floors of the west wing have been occupied hitherto by the College Chapel. The remaining space in the main building and in the wings is devoted to dormitory rooms which have been thoroughly modernized, and every comfort afforded by modern plumbing and sanitary arrangements has been added.

The building has also been beautified by a portico on the south front and by many improvements in the general finish of the building.

The alterations have been intended to secure every needed improvement without altering the general effect of the building. The sentimental value of this historical place in the collge life and thought has not been lost sight of.

PARDEE HALL

The most commanding position on the campus is occupied by this building, the most conspicuous evidence of the liberality of the late Ario Pardee, which reached to every department of the college. Here the departments of civil and electrical engineering are supplied with thoroly equipped laboratories and lecture rooms, and the museums of these departments, and of general geology, mineralogy, and physics are to be found. The handsome rooms of the two literary societies are also in this building, and the central portion of the second and third floors of the main building contain an auditorium seating about six hundred in which the Commencement exercises, lectures, and other public entertainments are held. The auditorium is notable for a stained glass window erected as a memorial to the late Ario Pardee and President Cattell. The subject of the window is Charlemagne and Alcuin.

THE VAN WICKLE MEMORIAL LIBRARY

The Van Wickle Library Building, the gift of the late Augustus S. Van Wickle, was dedicated on May 30, 1900. It is constructed of Pompeian brick and terra cotta, and thoroly furnished with the most approved modern appliances for library work. It contains two large reading rooms containing periodicals and reference books, a stack room, a librarian's room, and smaller rooms for special work.

The stack room, located on the northern side of the original building and conforming to it in its architecture, and fireproof, has accommodations from eighty to ninety thousand volumes. This was the gift of Miss Marjorie Van Wickle, in January, 1911, when the library had grown to such proportions as to require additional storage room for its books.

JENKS HALL

This building was erected in 1864–'65 by the late Barton H. Jenks, of Philadelphia. Originally the home of all the natural sciences, it is now devoted entirely to the work of the Department of Biology, and contains laboratories, lecture rooms and museums.

THE GAYLEY LABORATORY OF CHEMISTRY AND METALLURGY

completed in 1902, is occupied by the departments of chemistry and metallurgy. The building consists of three stories, and is constructed of Indiana stone, colonial brick, and gray terra cotta. It is fireproof, with steel and cement floors, and is well equipped. This building contains also the Henry W. Oliver Chemical and Metallurgical Library.

THE ASTRONOMICAL OBSERVATORY

erected as a memorial to the late Traill Green, M.D., was removed in 1915 to a new site north of Sullivan Road. In addition to the Observatory proper, it contains a lecture, with accommodations, for the students in astronomy.

WEST COLLEGE

erected originally for the purpose of a practice school for the department of education, and famous for many years as the location of the classroom of Professor Francis A. March, now contains the offices of the president, the treasurer and the bursar of the College.

GYMNASIUM AND MARCH FIELD

The importance of physical culture was early recognized by this College and a gymnasium was erected in 1884 and placed under the direction of competent instructor. The college has outgrown this building and a new gymnasium is urgently needed.

A splendid athletic field, known as March Field, has been secured through the efforts of the alumni. There is room in the enclosure for the football field, the baseball diamond, the quarter-mile track, and two field houses, together with stands accommodating about eight thousand people.

THE DORMITORIES.

A complete reorganization of the dormitory system was effected in the summer of 1900 by the building of central structures, known as Knox and Fayerweather Halls, to connect Blair and Newkirk Halls and Martien and Powell Halls, respectively, and the facing of the completed buildings with mottled Pompeian brick, trimmed with red terra cotta. A complete sanitary plumbing system of baths, sinks and closets, steam heat and electric lights have been installed in all the buildings. These dormitories together with East College and South College furnish accommodations for students.

INFIRMARY

A small building on McCartney Street immediately adjoining East College has been set apart for the use of students suffering from contagious diseases. This building has but rarely been called into service, but on several cases has served to prevent the extension of contagion by the isolation of single cases of diphtheria and scarlet fever which have occurred. For non-contagious cases of a serious character, the excellent hospital of the city offers the best modern conditions of treatment.

BRAINERD HALL

This building for the Y. M. C. A., the gift of J. Renwick Hogg, Esq., '78, of the Board of Trustees, was erected in 1902. It is a three-story gray stone building in the Tudor Gothic style. It contains a large room for the meetings of the society, and reading, writing, and committee rooms; also a trophy room of the athletic association, a room for the collection of curios from foreign missionary fields, and bowling alleys in the basement.

Its object is to afford a home under active Christian influences for all forms of student life.

COLTON MEMORIAL CHAPEL

A new chapel, dedicated October 25, 1916, is the gift of Mrs. Mary Roberts Colton of Jenkintown, Pa., in memory of her husband, the late John Milton Colton. The building is of gray Indiana limestone in the Georgian style. It has seats for 850 persons. It is equipped with a three manual Skinner organ. The stained glass window in the chancel with the subject "Paul preaching on Mars Hill" is the gift of Mr. and Mrs. S. W. Colton, Jr., in memory of Mr. Colton's parents. The ascension window in the west transept is the gift of Dr. Horace D. Bloombergh as a memorial of his parents. The carved oak pulpit is the gift of Rev. Leighton W. Eckard, D.D., in memory of his father, James Read Eckard, D.D., Professor of History and Rhetoric at Lafayette 1858–1871.

Mechanical Laboratory and Shops

This building erected for the Department of Mechanical Engineering is 102 feet by 185 feet, of steel and concrete construction, and contains, on the main floor, a wood-working shop 45 feet by 75 feet, a machine shop of the same dimensions, and a laboratory 45 feet by 150 feet, for steam and gas engineering. In the rear are a forge shop and foundry 40 feet by 45 feet each, boiler and storage rooms, lockers and lavatories.

Central Steam Plant

During the autumn of 1909 a central steam plant was established with a power house built of stone with a concrete roof containing large boiler and storage rooms with every convenience for the running of the plant. The power house is equipped with four 150-horsepower boilers.

Fraternity Houses

Eight national fraternities have chapter houses on the college campus under agreement with the Board of Trustees. These are in order of their erection, Delta Kappa Epsilon, Theta Delta Chi, Phi Delta Theta, Zeta Psi, Chi Phi, Delta Upsilon, Delta Tau Delta and Phi Gamma Delta. Phi Kappa Psi and Sigma Chi own houses, and Sigma Nu, Omega Delta Phi and Alpha Chi Rho rent houses, in the neighborhood of the campus. These houses furnish rooms for eight to eighteen men each, and table board for all their members.

Professors' Residences

There are fourteen houses for members of the Faculty on the campus. The fact that provision is made for residence upon the campus of so large a proportion of students and faculty makes possible a community life which is a valuable part of the college.

LIBRARY AND READING-ROOM

The College Library is located in the Van Wickle Memorial Library Building, previously described. It was established at the foundation of the College in 1832 and has had a steady growth. It is largely made up of books bearing directly on the courses of instruction.

It contains a large and valuable collection of the publications of the Early English Text Society, presented by the Class of 1871, a fine collection of books of English literature, given by the Class of 1875, and a collection of four hundred and fifty volumes in American literature, given by the Class of 1892. It also includes a collection of books and pamphlets written by the students, faculty, alumni and trustees of the College, called "The Lafayette Library" and representing the literary activities of Lafayette men. This unique and valuable collection now numbers six hundred and thirty-three titles and includes almost a full set of the College catalogs, Commencement addresses and official publications.

The reading room is supplied with well selected papers and periodicals, general and technical, in different languages. It also contains a papyrus scroll, five feet long, from a mummy case at Thebes, with a hieratic inscription in the characters of 1050 B.C.—pronounced by Seyffarth the finest he had seen—presented by the late Hon. John W. Garrett, of the Class of 1837; also a full length portrait of Lafayette, by Healey, presented by the late Dr. Thomas W. Evans; also a large collection of portrait prints and medals of Lafayette, presented by the late President William C. Cattell, D.D., LL.D.

In the Van Wickle Memorial Library Building will be found the Ward Library also, the gift of the heirs of C. L. Ward, Esq., of Towanda, Pa., which is largely made up of books of history and political science.

The Henry W. Oliver Chemical and Metallurgical Library, founded by the gift of $5000 by Henry W. Oliver, of Pittsburgh, Pa., and enlarged by gifts from Prof. Edward Hart and others, and containing the College collection of chemical books, is located in the Gayley Chemical and Metallurgical Building. This library recently received from a friend of the College all the pamphlets, about three thousand, belonging to the library of the late Prof. Johannes Wislicenus, of the University of Leipsic.

The literary societies of the College have in their Halls libraries numbering about six thousand volumes, largely of a literary character, valuably supplementing the other libraries.

The Class of 1871 has given to the College a fund, the proceeds of which are to be used for the purchase of the publications of the Early English Text Society.

The Class of 1875 at its reunion in 1905 by the gift of one thousand dollars established an alcove in the library to be known as "The Francis A. March Alcove."

The Class of 1892, at its decennial reunion in 1902, established an alcove in the library devoted to American literature.

SCIENTIFIC COLLECTIONS

These are extensive and valuable, and are rapidly increasing from year to year by gifts from societies and individual donors, and by special appropriations in addition to the fees for matriculation.

The apparatus in the department of physics and applied mechanics, the instruments used in the departments of astronomy and engineering, and the scientific equipment of the numerous and extensive laboratories meet the demands of advanced instruction in these departments.

GENERAL INFORMATION

ATTENDANCE

Attendance on all college exercises is required. Weekly reports of absences from all exercises are made to the Registrar. When this number, for any student, reaches fifteen he is warned. When it reaches twenty, he and his parents are notified. When it reaches thirty, he is suspended indefinitely from college. Absences may be permitted by the Dean of the College if caused by illness of two consecutive days or longer or for other urgent reasons, when requested by parents or guardian. Such permitted absences will not be counted in the totals just mentioned, but the student will be expected to make up the work lost. Absence from any recitation during the three days immediately preceding or following the Thanksgiving, Christmas, Mid-Year or Spring recess is counted as two absences and the student is debarred from further attendance upon recitations in that subject until he secures permission from the Dean to re-enter the course. Absence from noonday chapel is counted as a half absence and from Sunday church as two absences.

No student is permitted to take less than fifteen or more than twenty credit hours of work per week without special permission from the Committee upon Attendance and Standing.

CHANGE OF COURSE

No change of course shall be permitted in either term later than one week after the opening of the term.

BRAINERD HALL.

GRADES

At the end of each term, the grades of each student shall be reported by his instructors to the Registrar. Grades are expressed by the letters A, B, C, D, E, F, and Inc. Grade A denotes scholarship of 90 or above on a percentage basis; grade B, 80 to 90; grade C, 70 to 80; grade D, 60 to 70; grade E denotes a condition; grade F, a failure, removable only by the repetition of the course in class; Inc., incomplete.

EXAMINATIONS AND REMOVAL OF DEFICIENCIES

The regular examinations are held at the close of each term on the studies of that term. The examination period occupies the last ten days of the term.

Conditions received during the first term of any college year, must be made up before the beginning of the first term the following year; conditions received during the second term of any college year must be made up before the beginning of the second term of the following year. Only one examination shall be allowed for the removal of a condition, and this must be taken at the time scheduled by the faculty.

Upon removing a condition, a student shall receive a grade of D. Conditions and incompletes not removed before the beginning of the corresponding term of the following year shall be changed to a grade of F. If such subjects are required in the student's curriculum, they must be re-scheduled; otherwise, another course may be substituted.

STANDING

Students entering with conditions are required to make them up before the beginning of their Sophomore year.

If, at the close of any term, a student's deficiencies are such as to make it advisable in the judgment of the faculty either to classify the student with the next lower class or to drop him from college entirely, he may be denied the privilege of taking an examination as provided for in the paragraph entitled "The Removal of Deficiencies."

GRADUATION

Students who have pursued an entire course as prescribed and have successfully passed their examinations are recommended to the trustees for the first academic degree in course. Such recommendations are ordinarily acted upon and the degrees are conferred at Commencement, at which time the students receive diplomas from the President of the College. At Commencement the faculty awards such honors as it sees fit to those who are to receive degrees. These honors ordinarily consist of a valedictory oration, a Latin salutatory, and other honorary orations and theses.

DEGREES

The degrees granted by the College upon successful completion of the respective courses are *Bachelor of Arts* (A.B.), *Bachelor of Philosophy* (Ph.B.), *Bachelor of Science* (B.S.) for students in the divisions of Liberal Arts and Pure Science.

The degrees granted in Engineering are *Bachelor of Science in Chemical Engineering* (B.S. in Chem. E.), *Bachelor of Science in Civil Engineering* (B.S. in C.E.), *Bachelor of Science in Electrica Engineering* (B.S. in E.E.), *Bachelor of Science in Mechanical Engineering* (B.S. in M.E.), *Bachelor of Science in Mining Engineering* (B.S. in E.M.). The degree granted to Chemists is *Bachelor of Science in Chemistry* (B.S. in Chem.).

After 1919 the professional degrees of *Chemical Engineer* (Chem. E.), *Civil Engineer* (C.E.), *Electrical Engineer* (E.E.), *Mechanical Engineer* (M.E.), and *Mining Engineer* (E.M.) will be conferred upon a graduate holding the corresponding degree of Bachelor of Science in Engineering, who shall have spent three years subsequent to graduation in the study and practice of engineering, and who shall present a report of the same to the faculty, together with a satisfactory thesis or discussion of some particular work in which he has been engaged.

MASTERS' DEGREES

The degree of *Master of Arts may* be conferred upon a graduate holding a degree of Bachelor of Arts or Philosophy from Lafayette College or other institution of recognized standing, who has pursued a prescribed course of study in residence, equivalent to sixteen recitations per week for one year passed examinations in these subjects, and presented a satisfactory thesis.

MASTER OF SCIENCE.—The degree of *Master of Science* may be conferred upon Bachelors of Science or upon Bachelor of Science in Engineering upon the same conditions as those noted above for the degree of *Master of Arts*.

TERMS AND VACATIONS

The college year is divided into two terms. The first term begins on the Thursday nearest to September 20 and continues for nineteen weeks. The second term begins on the Monday following the close of the first term and continues for eighteen and a half weeks. Holidays and vacations are as announced in the calendar on page 4 of this bulletin.

PRIZES

NOTE.—In all cases where a prize is awarded to an essay or oration the successful competitor must hand to the proper authority two typewritten copies of his production before receiving the prize, if he is requested to do so.

EARLY ENGLISH TEXT SOCIETY PRIZE

A prize, consisting of books of the Early English Text Society, of London, is given by the society to that student of the Junior or Senior class who shall, at the close of the year, pass the best examination in "English before Chaucer." The examination is based upon selected texts announced from year to year, and will be awarded in 1917.

This prize was founded in 1871.

THE CLASS OF '83 PRIZE

A prize of the value of fifteen dollars is annually awarded to that member of the Sophomore class who shall have attained the highest standing in Trench on the Study of Words, the work carried on in connection with the introductory course in the study of the English language.

This prize was founded by the gift of $315 by the class of 1883 at their graduation.

THE GILBERT PRIZE IN OLD ENGLISH

By the will of Howards Worcester Gilbert, who died in Chester County, March 5, 1895, a bequest was left to the College amounting to $1000, with the provision that a gold medal of the value of forty dollars should be awarded every two years to the student writing the best essay on the Old English Language and Literature, beginning with Beowulf, in the earliest Anglo-Saxon period, and extending down to the year 1070. Should the competitors be of equal merit, preference is to be given to residents of Pennsylvania.

The medal is an inch and three-fourths broad, three-sixteenths of an inch thick, and contains on its face a relief portrait of King Alfred with the date 871–901, surmounted by the Anglo-Saxon phrase, "Naes he gold hwaete." The reverse shows a garland encircled with the legend, "Howard Worcester Gilbert Old English Prize. Founded 1895." Space is left for the name of the recipient.

This prize will be awarded in 1917. It is open to competition of students of Anglo-Saxon in the graduate course of 1916–1917. The essay must be handed in by May 1, 1917.

THE R. B. YOUNGMAN GREEK PRIZE

The class of 1884, at its vigintennial reunion, subscribed the sum of $500, the income of which is to be awarded to that member of the Sophomore class who shall attain the greatest proficiency in Greek.

THE BLOOMBERGH PRIZE

The class of 1888 offers annually a prize of forty dollars to that member of the Junior class who shall attain the greatest proficiency in the study of the French and German languages and their literatures.

THE JAMES ALEXANDER PETRIE PRIZE IN FRENCH

A prize of the annual value of $50 has been put at the disposal of the College as a memorial to the late James Alexander Petrie, M.D., of Phillipsburg, New Jersey. It will be awarded to that member of the Junior class who shall attain the greatest proficiency in the Department of Romance Languages.

HISTORICAL ESSAY PRIZE

A prize consisting of a copy of his work, "*The Marquis de Lafayette in the American Revolution,*" is given annually by Charlemagne Tower, Jr., LL.D., of Philadelphia, to that member of the Senior class who shall, on or before the first day of October, present the best essay on some subject connected with the relations of *France and the United States*. The essay must not exceed three thousand words in length.

THE B. F. BARGE GOLD MEDAL

A prize of a gold medal of the value of $100 was founded by Benjamin F. Barge, Esq., of Mauch Chunk, Pa., to be awarded to that member of the Senior class who shall deliver the best oration in an annual contest to be held on Memorial Day, May 30th. The contestants, not more than six in number, are to be chosen by a committee of the faculty from those members of the Senior class, who shall hand in orations on or before May 1st upon topics assigned by the committee not later than March 25th of each year.

PRIZES IN ORATORY

The Washington and Franklin literary societies appropriate one hundred dollars a year for prizes in oratory. Four contestants are chosen from each Hall to take part in the Junior Oratorical Contest, which is held in May. In the presence of a public audience three judges, approved by the faculty, hear the speakers and award the prizes. Their decision is based on the merit of the performances as to originality and force, with reference both to composition and delivery. The first prize is fifty dollars, the second prize thirty dollars, and the third prize twenty dollars.

COLEMAN BIBLICAL PRIZES

Prizes, each of the value of ten dollars, are awarded to those students of the Freshman class who have attained the highest standing in the several divisions of Biblical study in that year.

These prizes were founded by the Rev. Lyman Coleman, D.D., in 1880.

THE ASTRONOMICAL PRIZE

A prize of thirty dollars in gold is awarded to the student making the greatest progress in the study of astronomy in the Junior or Senior year.

MATHEMATICAL PRIZES

Two prizes, one of the value of twenty-five dollars and one of the value of fifteen dollars, are offered to those students of the Sophomore class who shall have exhibited during the first two years of the course the greatest proficiency in the study of Mathematics. In 1914 these prizes were given to students in the Technical division and in 1915 they were awarded to students in the division of Arts and Sciences and hereafter they will be awarded in alternate years to students in the two Mathematical courses.

These prizes were founded, as was the Astronomical prize above mentioned, in 1867, by Professor Traill Green, M.D., LL.D.

BARGE MATHEMATICAL PRIZES

By the bequest of the late Benjamin F. Barge, Esq., of Mauch Chunk, three prizes of a total value of one hundred dollars have been established for excellence in mathematical studies. These prizes are awarded to members of the Sophomore class for excellence in the solution of original problems. In 1914 these prizes were given to students in the division of Arts and Sciences, and in 1915 they were awarded to students in the Technical division, and hereafter they will be awarded in alternate years to students in the two mathematical courses.

'85 PRIZE IN PHYSICS

The class of 1885 founded a prize in 1897 by a gift of $500, the annual income of which is given to that member of the Junior class who attains the highest rank in the study of physics.

THE CHEMICAL ESSAY PRIZE

A prize of five dollars in books in awarded each term to that member of the Junior or Senior class who shall present the best term theme on some chemical subject.

CIVIL ENGINEERING PRIZE

A prize of the value of fifty dollars, the gift of Carrol Phillips Bassett, C.E., Ph.D., of the class of 1883, is annually awarded to that member of the graduating class who presents the best graduating thesis and attains the highest standard of scholarship in the Civil Engineering Course.

RELIGIOUS INSTRUCTION

Lafayette College aims to be distinctly Christian and is related to the Presbyterian Church not only historically and legally but by hearty accord in spirit and purpose. Religious instruction is carried on with a view to the development of Christian manhood and leadership in Christian service, not in any sectarian sense, but in full accord with essential truth as accepted by all evangelical Christians. Instruction in the Bible has always held a prominent place in the college and in 1916 the Helen H. P. Manson Chair of Bible and College Pastorate was endowed with fifty thousand dollars and a manse and Rev. Harold M. Robinson appointed to the position.

Prayers are held each morning in the chapel at twelve o'clock and services in the chapel Sunday mornings at 11 o'clock. All students are expected to attend these services. Where there is some exceptional reason assigned by the parents, students will be permitted to attend one of the churches in Easton instead of the Sunday morning service. This permission will be granted only on request of parents and for sufficient reason.

Special sermons are preached before the college from time to time by distinguished ministers. The preachers for 1916–1917 are:

ROLL OF PREACHERS

1916

October 8, 1916—Rev. Minot C. Morgan, D.D., Central Presbyterian Church, Summit, N. J.

October 15, 1916—Rev. Samuel M. Jordan, D.D., Teheran, Persia.

October 22, 1916—Rev. Frank W. Sneed, D.D., East Liberty Presbyterian Church, East Liberty, Pa.

October 29, 1916—Rev. Samuel G. Craig, St. David's, Pa.

November 5, 1916—Rev. Henry E. Jackson, D.D., Washington, D. C.

November 12, 1916—Rev. Henry Mitchell MacCracken, D.D., LL.D., Chancellor Emeritus, New York Univ., New York.

November 19, 1916—Rev. Harold M. Robinson, D.D., Market Square Presbyterian Church, Germantown, Pa.

November 26, 1916—Rt. Rev. James Henry Darlington, D.D., Bishop of Harrisburg, Pa.

December 10, 1916—Rev. W. Douglas Mackenzie, D.D., President Hartford Seminary Foundation, Hartford, Conn.

December 17, 1916.—Rev. A. E. Piper, D.D., First Methodist Episcopal Church, Wilkes-Barre, Pa.

1917

January 7, 1917—Rt. Rev. Joseph E. Berry, D.D., Bishop of the Methodist Episcopal Church, Philadelphia, Pa.

January 14, 1917—Rev. J. Ross Stevenson, D.D., LL.D., President Princeton Theological Seminary, Princeton, N. J.

January 21, 1917—Rev. George B. Stewart, D.D., LL.D., President Auburn Theological Seminary, Auburn, N. Y.

January 28, 1917—Rt. Rev. Ethelbert Talbot, S.T.D., Bishop of Bethlehem, Pa.

February 11, 1917—Rev. Andrew Mutch, D.D., Bryn Mawr Presbyterian Church, Bryn Mawr, Pa.

February 18, 1917—Rev. M. B. Jennings, D.D., First Presbyterian Church, Germantown, Pa.

February 25, 1917—Rev. Frank MacDonald, D.D., First Baptist Church, Chester, Pa.

March 4, 1917—Rev. Charles R. Erdman, D.D., Princeton Theological Seminary, Princeton, N. J.

March 11, 1917—Rev. Harold M. Robinson,

March 18, 1917—Rev. William Pierson Merrill, D.D., The Brick Presbyterian Church, New York City.

March 25, 1917—Rev. John McDowell, D.D., Brown Memorial Church, Baltimore, Md.

April 1, 1917—Rev. Walter Rauschenbusch, D.D., Baptist Theological Seminary, Rochester, N. Y.

April 15, 1917—Rev. Lewis Seymour Mudge, D.D., Pine Street Presbyterian Church, Harrisburg, Pa.

April 22, 1917—Rev. Robert MacGowan, D.D., First Presbyterian Church, Lancaster, Pa.

April 29, 1917—Rev. Samuel Martin, D.D., Presbyterian Church, State College, Pa.

May 6, 1917—Rev. William Hiram Foulkes, D.D., Philadelphia, Pa.

May 13, 1917—Rev. Harold M. Robinson.

May 20, 1917—Rev. Alexander MacColl, D.D., Second Presbyterian Church, Philadelphia, Pa.

LECTURES

In addition to the lectures given in connection with the respective departments lectures upon subjects of general interest are given upon Wednesday afternoon before the whole student body. Some of the lectures for the year are:

October 18—Dr. Edgar J. Banks, on "A Thousand Miles down the Tigris."

October 25—Rev. Robert MacGowan on "The Final Purpose of the Bible."

November 8—Mr. H. L. Fogleman, on "The Science of Business Building."

November 15—Rev. S. M. Jordan, D.D., on "Travel and Education in Persia."

November 22—Professor E. G. Conklin, on "Some Phenomena of Inheritance, Especially in Man."

December 13—Mr. W. S. Ayres, on "The Geological Study of a Submarine Area."

January 17—President H. N. MacCracken, on "Democracy in Dialect."

COLLEGE SOCIETIES

THE PHI BETA KAPPA SOCIETY

A chapter of the Phi Beta Kappa fraternity known as the Gamma chapter of Pennsylvania was established at Lafayette College in 1889. Students of high standing are elected to membership in their Senior year.

LITERARY SOCIETIES

The *Washington* and *Franklin* societies were organized early in the history of the College and are conducted by the undergraduates. Both societies have well-furnished apartments in Pardee Hall, and valuable libraries. They meet every Wednesday evening for literary exercises, consisting of orations, essays, and debates. A generous rivalry for College honors exists between them, and each year representatives of the two societies from the Junior class engage in a public contest in oratory. On the day before Commencement the societies hold reunion meetings in their halls. These societies are an important part in College life and work, and *all students are strongly advised to join them.*

YOUNG MEN'S CHRISTIAN ASSOCIATION

The voluntary religious interests of the students are fostered by the college Y. M. C. A. 1832 marked the beginning of this work in Lafayette when the Brainerd Society, named in honor of David Brainerd devoted missionary to the Indians of this section, was formed. Originally devoted to the promotion of the cause of missions, its work has since broadened to include associated religious interests. In 1877, when the intercollegiate movement of the Y. M. C. A. began to assume such a great place in the Christian activities of the land, Brainerd Society became affiliated with it. The original name, however, was retained and the organization is now known as Brainerd Society of the Young Men's Christian Association. The Association enjoys the use of a large building upon the campus, erected in 1902 at a cost of $45,000. This building is the gift of Mr. James R. Hogg, of the class of 1878, and is utilized exclusively for student activity purposes. The Association aims to create a wholesome religious atmosphere among the students and to enlist them in some form of Christian service on the campus, and in the city of Easton and vicinity.

BIOLOGICAL SOCIETY

The *Biological Society* is for the purpose of making its members intelligent concerning the important biological questions of the day, enabling them to appreciate the value of research in nature. The membership consists of those students of the three upper classes who are either prospective or present members of the classes in biology, and of such graduate students as are interested in the laws of life comprehended through the natural history sciences.

CHEMICAL CLUB

A *Chemical Club* has been organized by the students, for reading and discussing papers contained in the current chemical magazines, and to listen to lectures from visiting chemists.

DEUTSCHER VEREIN

The *Deutscher Verein*, which is open to all students who are interested in German life, language and literature, meets at frequent intervals for lectures, singing, discussions, social intercourse and practice in speaking German. A dramatic entertainment in the German language is give during the year.

CIVIL ENGINEERING SOCIETY

A society organized to advance the study of prominent engineering works.

SOCK AND BUSKIN

A society organized for the production of plays and the promotion of interest in dramatic literature. A play is given annually during the second term and repeated at commencement.

LAFAYETTE COLLEGE BAND AND ORCHESTRA

A College band was organized in 1910 and is maintained by the students under the direction of Mr. F. W. H. Freeman.

LAFAYETTE COLLEGE MUSICAL ASSOCIATION

A Glee Club and a Mandolin Club are maintained by the students, and concerts given from time to time.

ATHLETICS

College athletics are under the direction of the Director of Athletics appointed by the Board of Trustees and the Faculty's Committee on Athletics, in acting in co-operation with the Athletic Association of Lafayette College. Teams are maintained by the students in football, baseball, soccer, tennis, basketball, wrestling and track athletics. No student may participate in intercollegiate athletics as a member of a college team unless the written consent of his parents or guardian has previously been filed with the Registrar.

COLLEGE PUBLICATIONS

The College Bulletin is published quarterly by the College and includes the annual catalog, the annual reports of College officers, the annual alumni announcements, and other announcements as required. It will be sent free upon request addressed to the Registrar.

The Lafayette is published weekly during the college year as a newspaper by the students of the College. The subscription price is two dollars a year.

The Melange is published annually by the Junior class as the College annual, and contains a record of all student organizations. The price is two dollars.

DEGREES CONFERRED

HONORARY DEGREES

June 14, 1916

DOCTOR OF DIVINITY—Rev. William E. Brooks, Allentown, Pa., Pastor of the First Presbyterian Church.

Rev. Samuel M. Jordan, '95, Teheran, Persia, Principal of Boys School and Missionary.

Rev. Arthur Russell Taylor, '83, York, Pa., Rector of St. John's Protestant Episcopal Church.

DOCTOR OF LAWS—William M. Irvine, Mercersburg, Pa., Headmaster of the Mercersburg Academy.

Samuel Rea, Bryn Mawr, Pa., President of the Pennsylvania Railroad Company.

DOCTOR OF SCIENCE—Samuel G. Dixon, Philadelphia, Pa., Commissioner of Health of the Commonwealth of Pennsylvania.

George J. Ray, East Orange, N. J., Chief Engineer of the Delaware, Lackawanna & Western R. R.

Albert H. Welles, '89, Scranton, Pa., Principal of the High School.

MASTER OF ARTS—Henry C. Edgar, '05, Pottstown, Pa., English Master in the Hill School.

CIVIL ENGINEER—Chester Allen, Gettysburg, Pa., Professor of Civil Engineering, Pennsylvania College.

James R. Schick, '76, Roanoke, Va., Division Engineer of the Norfolk & Western R. R.

ELECTRICAL ENGINEER.—David F. Atkins, New York City, Chief Engineer of Lighting, Department of Water Supply, Gas and Electricity, New York City.

October 25, 1916

DOCTOR OF DIVINITY—Rev. Herbert W. Bieber, '94, Tyrone, Pa., pastor of the First Presbyterian Church.

Rev. Irving H. Berg, '01, Watervliet, N. Y., pastor of the North Reformed Church.

Rev. Daniel H. Overton, '88, Islip, N. Y., pastor of the Islip Presbyterian Church.

Rev. Andrew Mutch, Bryn Mawr, Pa., pastor of the Bryn Mawr Presbyterian Church.

DEGREES IN COURSE

June 14, 1916

Bachelor of Arts

H. M. Black, Pa.
T. D. Carey, Pa.
R. N. Clark, Pa.
F. O. Hathaway, N. Y.
P. S. Hench, Pa.
R. D. Herring, Pa.
R. L. Logan, Pa.
H. G. Neely, Pa.
T. B. Reifsnyder, N. Y.
L. A. Smith, Pa.
J. L. Trowbridge, Pa.
T. A. Williams, Pa.
J. S. Young, N. J.

Bachelor of Philosophy

C. J. Brown, N. J.
W. E. Delaney, Jr., Pa.
J. H. Dyer, Pa.
L. M. Felmly, N. J.
H. L. Foster, N. Y.
T. Freeman, Pa.
W. J. Gaynor, N. J.
F. A. Glisencamp, N. J.
H. N. Hartman, Del.
B. S. Hoffenstein, Pa.
P. H. Hugus, Pa.
J. R. Irwin, Pa.
H. M. Jacobs, Pa.
W. I. Kocher, Pa.
K. W. Kressler, Pa.
F. M. Murphy, Pa.
J. S. Oller, Pa.
R. W. Rohn, N. J.
F. C. Shotwell, N. J.
M. W. Sloyer, Pa.
H. J. Smith, Pa.
S. B. Stilwell, Pa.
J. N. Stipe, Pa.
L. S. Stone, Conn.
R. B. Stone, Pa.
H. H. Thomas, Pa.
O. S. Tischler, Pa.
C. R. Wackenhuth, Pa.
W. I. Woodcock, Jr., Pa.

Bachelor of Science

J. W. B. Bausman, Jr., Pa.
H. J. Bubb, Pa.
C. T. Dodd, N. J.
J. E. Donmoyer, Pa.
C. W. Forshee, N. J.
G. S. Freeman, Pa.
H. R. Goldthwaite, Ind.
J. Livingston, N. J.
S. Livingston, N. J.
J. P. Mayfield, D. C.
G. H. Stoutenburgh, N. J.
C. X. Thomas, Pa.
E. Welles, Jr., Pa.

Bachelor of Science in Chemistry

G. L. Alexander, Pa.
H. W. Anderson, N. J.
J. S. Beddall, Jr., Pa.
B. M. Livezey, Pa.
N. W. Miller, D. C.
M. K. Myers, D. C.

E. A. Brinker, Pa.
R. C. Cain, Pa.
C. A. Hess, Pa.
S. K. Johnson, Pa.
H. M. Keller, Pa.
P. A. Laird, Pa.
H. H. Offutt, Ind.
H. V. Stewart, Pa.
G. B. McC. Troxell, Pa.
R. B. Unangst, Pa.
F. F. Weaver, Pa.
J. G. Williamson, N. J.

Civil Engineer

J. Q. Adams, Pa.
C. S. Clark, N. Y.
G. N. Cohen, D. C.
F. Drexel, N. Y.
S. de C. Freire, Brazil.
J. H. Gaffin, N. Y.
W. B. Grigsby, D. C.
J. R. Kuechel, N. J.
R. B. Lloyd, D. C.
L. T. McCormick, N. J.
F. A. March, Pa.
G. A. Morgan, Pa.
L. N. Morgan, Pa.
J. H. Neighbour, Jr., N. J.
N. K. Pearson, Pa.
E. A. Pitcher, N. J.
W. A. Pollard, Jr., D. C.
W. F. Remaly, Pa.
G. J. Richards, Pa.
W. H. Wilson, N. J.
E. W. Woehling, N. J.
L. B. Wyckoff, N. J.
R. H. Wyckoff, N. J.

Mining Engineer

H. K. Rollins, Va.

Mechanical Engineer

K. J. Ammerman, Pa.
D. McM. Blackburn, Pa.
F. H. Compton, N. J.
S. F. Downs, Pa.
I. D. Everitt, N. J.
R. H. Fritz, N. J.
R. W. Logan, Pa.
J. F. Luhr, N. J.
W. L. Matthews, N. J.
A. S. Woods, Pa.

Electrical Engineer

N. W. Bailey, N. J.
A. H. Drummond, Pa.
F. B. Hunt, N. J.
H. Mumma, Pa.
C. H. Ribble, N. J.
E. R. Smith, Pa.
H. J. Woodward, N. J.
L. R. Fox, Pa.
R. S. Kramer, Pa.
D. J. Perry, Pa.
F. H. Schlough, Pa.
C. E. Woodring, Pa.

Master of Arts.

W. Aston, A.B., '11.
J. I. Kinsey, Jr., A.B., '02.
W. Wiley, A.B., '71.
E. G. Wilson, A.B., '07.
F. N. Miller, A.B., '14.

Master of Science

M. T. Hagerty, Jr., B.S., '15
F. P. McCluskey, Ph.B., '02.
H. J. Lockwood, E.E., '13

COMMENCEMENT DISTINCTIONS, 1916

HONORS—George M. Cohen, Washington D. C.; John H. Dyer, Scranton, Pa.; Lloyd M. Felmly, Phillipsburg, N. J.; Willard A. Pollard, Jr., Washington, D. C.; Bernard S. Hoffenstein, Wilkes-Barre, Pa.

ORATIONS—Floyd H. Compton, Springtown, N. J.; Louis R. Fox, Easton, Pa.; Francis O. Hathaway, Deposit, N. Y.; Ray D. Herring, Pen Argyl, Pa.; Solomon Livingston, Dover, N. J.; Robert L. Logan, Philadelphia, Pa.; Harold H. Offutt, Washington, D. C.; Frank H. Schlough, Easton, Pa.; Henry J. Smith, New Oxford, Pa.; Russell B. Stone, Easton, Pa.; William F. Remaly, Easton, Pa.; Ross W. Rohn, Shiloh, N. J.; James L. Trowbridge, Easton, Pa.; Richard B. Unangst, Wilkes-Barre, Pa.; John S. Ollen, Waynesboro, Pa.

HONORARY ORATIONS—George Nathaniel Cohen, *The Scientific Oration;* John Hannaniah Dyer, *The Valedictory;* Lloyd McPherson Felmly, *The Latin Salutatory;* Bernard Sol. Hoffenstein, *The Literary Oration;* Willard Averell Pollard, Jr., *The Engineering Oration.*

PRIZES AWARDED

SENIOR PRIZEMEN

THE ASTRONOMICAL PRIZE—John Secrist Oller, Waynesboro, Pa.

THE B. F. BARGE PRIZE IN ORATORY—Thomas Arthur Williams, Fullerton, Pa.; Second Prize, John Hannaniah Dyer.

CIVIL ENGINEERING PRIZE—Divided between Sylvio de Campos Freire and William Averill Pollard, Jr.

JUNIOR PRIZEMEN

THE CLASS OF '85 PRIZE IN PHYSICS—Roland Wilbur Brown, Aquashicola, Pa.

THE FRANCIS A. MARCH PRIZE IN ENGLISH—Joseph Alexander McCurdy, Jr., Greensburg, Pa.

THE SHAKESPEARE PRIZE—Roger Hunt Blake, Trenton, N. J.

THE BLOOMBERGH PRIZE IN GERMAN—Cecil Blair Rodgers, Sugar Run, Pa.

THE JAMES ALEXANDER PETRIE PRIZE—Kenneth M. Bixler, Easton, Pa.

SOPHOMORE PRIZEMEN

THE TRAILL GREEN MATHEMATICAL PRIZES—*First,* Albert Mathis Weber, Washington, D. C. *Second,* Divided between Walter Gehret Kleinspehn, Reading, Pa., and Charles Gerald Palmer, Pen Argyl, Pa.

THE B. F. BARGE MATHEMATICAL PRIZES—*First,* Walter McKinley

Miller, South Orange, N. J. *Second,* Marshall Rinker Metzgar, Stroudsburg, Pa.

THE CLASS OF '83 PRIZE IN ENGLISH—Alvan Ray Kirschner, Hazleton, Pa.

THE R. B. YOUNGMAN GREEK PRIZE—Paul Staley Grant, Oak Park, Ill.

FRESHMAN PRIZEMEN

THE PARK PRIZE IN LATIN—Alan M. Kaufman, Washington, D. C.

THE LYMAN COLEMAN BIBLE PRIZES—*Division A*, Carleton K. Gradwohl, Easton, Pa. *Division B*, Louis F. Huttenlocher, Patchogue, N. Y. *Division C,* Adolph Al. Buechner, Ozone Park, N. Y. *Division D,* Harry W. Barrick, Trenton, N. J. *Division E,* David W. Roberts, Scranton, Pa. *Division F,* Ernest F. Williams, Washington, D. C.

THESES

PARDEE SCIENTIFIC DEPARTMENT

1. The Effect of Abnormal Air Pressure on the Tensile Strength and Time of Setting of Cement. Gerald Amos Morgan, Harrisburg, William Franklin Remaly, Easton.

2. A Comparison between the Tensile and Transverse Testing of Cement. George James Richards, Wilkes-Barre.

3. The Standardization of Sizes of Crushed Stone. Leon Newpher Morgan, Harrisburg.

4. An Investigation of Local Sands. James Hanch Neighbour, Jr., Dover, N. J., Edward Arthur Pitcher, Dover, N. J.

5. The Comparison of the Bond Strength of Slag Concrete with Crushed Stone Concrete. Frederick Drexel, Brooklyn, N. Y., Lawrence Thomas McCormick, Belmar, N. J.

6. A Project for the Hydro-Electric Development of the Delaware River, Easton, Pa. Sylvio de Campos Freire, Sao Paulo, Brazil; William Averell Pollard, Jr., Washington, D. C.

7. A Design for the Elimination of the Grade Crossing of the Penna. R. R., at Union Square, Phillipsburg, N. J. Richard Bennett Lloyd, Washington, D. C.; Francis Andrew March, Harrisburg.

8. Comparative Strength of Stone and Slag Concrete. George Nathaniel Cohen, Washington, D. C.; Walter Berton Grigsby, Washington, D. C.

9. The Co-efficient of Expansion of Concrete. Russell Holcombe Wyckoff, Flemington, N. J.

10. The Design of a Reinforced Concrete Arch and Plan for Testing.

Charles Samuel Clark, Binghamton, N. Y.; John Raymond Kuechel, Elizabeth, N. J.

11. The Design of a Sewage Disposal Plant for East Orange, New Jersey. William Henry Wilson, Perth Amboy, N. J.; Edwin Willard Woehling, East Orange, N. J.

12. An Improved Extensometer. Lewis Benjamin Wyckoff, Asbury Park, N. J.

13. The Verification of the Laws of Flexure as Applied to Reinforced Concrete Beans. John Henry Gaffin, Wyoming, N. Y.; Norman Kethlege Pearson, Flicksville.

14. A Comparison of Methods of Mixing Cement Mortar. John Quincy Adams, Easton.

15. Carnotite and the Preparation of Uranium and Vanadium Salts. Harold Van Allen Stewart, Quakake.

16. The Manufacture of Commercial Hydrochloric Acid. Joseph Shakespeare Beddall, Tamaqua.

17. The Manufacture of Sodium Carbonite by the Solvay Process. Joseph Gilliard Williamson, Bloomsbury, N. J.

18. The Nitration of Benzene. Harold Herman Offutt, Washington, D. C.

19. The Manufacture of Anhydrous Calcium Chlorid. Sedgwick Kistler Johnson, Easton.

20. The Economical Production of Sulfuric Acid from Hydrogen Sulfid. George Lenher Alexander, Everett; Bennett Moorhead Livezey, Doylestown.

21. The Manufacture of Barium Chlorid. Christian Aaron Hess, Stroudsburg,

22. The Manufacture of Sodium Sulfid. Richard Cameron Cain, Berwick.

23. The Manufacture of Nitric Acid. Paul Angier Laird, West Chester.

24. The Manufacture of Strontium Hydroxide from Celestite. Harry Melick Keller, Stroudsburg.

25. Phthalic Acid from Naphthalene. Richard Britton Unangst, Wilkes-Barre.

26. Carbon Tetrachlorid. Milton Kendall Myers, Washington, D. C.; George Brinton McClelland Troxell, Easton.

27. The Commercial Production of Aniline. Norman William Miller, Washington, D. C.

28. The Manufacture of Sulfur Dioxid (Liquefied). Frank Frederick Weaver, Easton.

SOUTH COLLEGE.

29. The Metallography of Malleable Iron Castings. Earl Andrew Brinker, Easton.

30. General Geology of the New Jersey Highlands and a Review of the Washington Mines at Oxford, N. J. Herbert Knapp Rollins, New York, N. Y.

31. Testing of an Alternating Current Motor with Different Rotors. Harold Wilbur Bailey, Milburn, N. J.; Chauncey Hoffman Ribble, Washington, N. J.; Harold John Woodward, Cookstown, N. J.

32. Investigation of the Lines of the Northampton-Easton and Washington Traction Company. Alfred Hall Drummond, Nanking, China; Harold Mumma, Steelton; Clark Ellis Woodring, Hazleton.

33. Investigation of Operating Problems of the Bangor and Portland Electric Railway with Regard to Engineering Conditions. Louis Rodman Fox, Easton; Frederick Blackburn Hunt, Trenton, N. J.; Earl Russell Smith, Easton.

34. Installation and Investigation of a Special Direct Current Interpole Generator-Motor. Russell Stewart Kramer, Easton; Daniel James Perry, Easton; Frank Huff Schlough, Easton.

35. The Effect of Varying the Vanadium Content in Gray Iron Castings. Isaac Dill Everitt, Hackettstown, N. J.; Richard Whitney Logan, Scranton.

36. Heat Balance Test on Secor Kerosene Engine. John Frederick Luhr, Roselle Park, N. J.; William Leo Matthes, Phillipsburg, N. J.

37. Cost Analysis of Autogenous Welding. Russell Harrison Fritz, High Bridge, N. J.; Archie Scott Woods, Easton.

38. Investigation for Plant Test, People's Water Company's Pumping Station, Phillipsburg, N. J. Daniel McMichael Blackburn, Easton; Sydney Fetherman Downs, Easton; Floyd Hoff Compton, Springtown, N. J.

39. Some Investigations of the Heat Treatment of Steel. Karl Janeway Ammerman, Scranton.

40. The Purification of Common Salt. Harold William Anderson, Paterson, N. J.

ABBREVIATIONS FOR BUILDINGS AND COURSES OF STUDY

Brd.—Brainerd Hall.
B.—Blair Hall.
E.—East Hall.
F.—Fayerweather Hall.
K.—Knox Hall.
M.—Martien Hall.
McC.—McCartney St.
McK.—McKeen Hall.
N.—Newkirk Hall.
P.—Powell Hall.
S.—South College.
Sp.—Special.
Eng.—Engineering
P.M.—Pre-medical.

———Absent at time of publication of catalogue.

THE ALUMNI ASSOCIATIONS

The Alumni Association is composed of graduates of the College, and such former students as left College before graduation in good standing, as may be elected. The annual meeting is held on Saturday preceding Commencement Day.

The Association has the privilege of nominating every alternate year two members of the Board of Trustees, who hold office for six years. In June, 1916, Carrol Phillips Bassett, '83, of Summit, N. J., and Abraham Carpenter Overholt, '84, of Scottdale, Penna., were chosen trustees for the full term, and Harry Newton Hempstead, '91, of New York, N. Y., for the unexpired term of E. J. Kerrick, deceased.

The officers of the Association for 1916–17 are: *President,* Cyrus E. Woods, '86; *Vice-President,* E. G. Smith, '94; *Secretary and Treasurer,* J. F. Stonecipher, '74.

The Executive Committee is as follows: Chairman, Dr. McCluney Radcliffe, '77; George W. W. Porter, '85, R. F. Whitmer, '85, James W. Fox, '88, George A. McIlvaine, '89, E. C. Chalfant, '95, Asher J. Odenwelder, Jr., '06, and Bayard Hand, '99.

It is desirable to keep up the full record, so long maintained, of the residences, occupations, literary efforts, and public services of the alumni and former students of the College.

Information is solicited in regard to these points, and also in reference to matters appropriate to the obituary record, which is annually prepared, for the Alumni Association.

Each alumnus is asked to send his personal record, carefully revised to date, to the Secretary before May 1, 1917.

BRANCH ASSOCIATIONS

NORTHEASTERN PENNSYLVANIA

JOHN B. CRAVEN, '92, Wilkes-Barre........................*President*
OSCAR J. HARVEY, '71, Wilkes-Barre......................*Secretary*

PHILADELPHIA AND VICINITY

FRANK B. ELLIS, '91, 1416 S. Penn Sq., Phila.............*President*
CHARLES B. ADAMSON, '77, 222 Walnut St., Phila..........*Secretary*

NEW YORK AND VICINITY

GEO. W. W. PORTER, '85, Broad & Market Sts., Newark....*President*
DUDLEY E. LATHAM, '05, 165 Broadway, New York.......*Secretary*

WESTERN PENNSYLVANIA

Frank M. Graff, '88, Blairsville........................*President*
E. G. Cunningham, '13, Sewickley......................*Secretary*

WASHINGTON, BALTIMORE AND VICINITY

Edwin J. Farber, '77, 1243 Calvert Bldg., Baltimore, Md..*President*
Eli Swavely, '96, 4101 Connecticut Ave., Washington, D. C..*Secretary*

THE WEST BRANCH

Fred H. Payne, '88, Williamsport.......................*President*
R. Fleming Allen, '90, Williamsport...................*Secretary*

CENTRAL PENNSYLVANIA

John E. Fox, '85, Harrisburg............................*President*
Frank P. Snodgrass, '90, Harrisburg...........*Acting Secretary*

HAZLETON

W. S. Ayres, '72, Hazleton, Pa..........................*President*
J. E. Anderson, '94, Hazleton, Pa......................*Secretary*

CHICAGO AND VICINITY

Nathan Grier Moore, '73, 1605 Marquette Bldg., Chicago..*President*
W. Harold Fee, 175 W. Jackson Bd., Chicago.............*Secretary*

ALUMNI VISITING COMMITTEES 1916–1917

Classics—John R. Davies, '81, Harvey M. Watts, '86, James T. Dennis, '87, and Herbert W. Bieber, '94.

Mathematics—Joseph H. Tudor, '86, Chairman, Arthur C. Palmer, '91, Archibald Howard, '92, Secretary, and James G. Hardy, '94.

Chemistry—Clayton W. Holmes, '69, Porter W. Shimer, '78, Chairman and Secretary, George P. Adamson, '84, Charles D. Fuller, '88, Henry Fay, '89, and Gideon Boericke, '96.

Physics—Henry W. Cattell, '83, Albert H. Welles, '89, Arthur F. Nesbitt, '92, George A. Sigman, '05, Chairman and Secretary, and George A. Koerber, '08.

History—Harry L. Moore, '88, Benjamin Douglas, '71, R. M. Stocker, '73, Chairman and Secretary, George C. Austin, '85, and I. C. Elder, '89.

Government and Economics—Montgomery Evans, '75, Emerson Collins ,'84, John R. Farr, '85, George W. W. Porter, '85, Cyrus E. Woods, '86, Frederick C. Kirkendall, '94, Secretary, Benjamin B. Howell, '87, Wilbur P. Graff, '91, Thomas W. Pomeroy, '96, and Leslie G. Gates, '97, Chairman.

Biology—Casper Dull, '77, James Clifton Edgar, '82, Joseph Dysart Findley, '01, Chairman and Secretary, and Albert K. Detwiller, '01.

Geology—John A. Miller, '95, and Hervey W. Shimer, '99.

English—James W. Bright, '77, Henry Albert Potter, '77, Fred R. Drake, '86, Secretary, and Herman L. Collins, '87, Chairman.

Modern Languages—Marcus B. Lambert, '82, Chairman, and Carl F. Pfatteicher, '03, Secretary.

Music—Henry D. Maxwell, '82, and George B. Nevin, '83.

Library—Henry F. Marx, '85, Chairman, Alden March, '90, Ernest G. Smith, '94, and Bernard J. Myers, '01, Secretary.

Physical Training and Athletics—Rush N. Harry, '89, Wayne Dumont, '92, Charles Kelchner, '98, Charles R. Rinehart, '99, and Joseph S. Rodenbough, '14.

Civil Engineering—George G. E. Datesman, '83, Charles S. Krick, '87, W. M. Sterrett, '88, Robert D. Snodgrass, '96, and Almon H. Fuller, '97.

Electrical Enginnering—Frank M. Potter, '96, Secretary, and Eli Swavely, '96, Chairman.

Mechanical Engineering—Wm. Henry Hulick, '73, Charles R. Rodenbough, '88, George D. McIlvaine, '89, Horace C. Booz, '95, Chairman and Secretary, and Fred E. Ayer, '00.

Mining Engineering—Harry Scott Gay, '83, Chairman, Joseph B. Dickson, '83, Frank L. Garrison, '83, William D. Ord, '87, Frank M. Graff, '88, William D. Tyler, '88, and Joseph P. Jennings, '04, Secretary.

Philosophy and Psychology—Henry B. Howell, '86, Henry T. Beatty, '87, Henry M. Jackson, '93, Edwin B. Twitmeyer, '96, and Irving H. Berg, '01.

Education—Edwin W. Chubb, '87, William A. Wetzel, '91, William Grant Chambers, '94, Chairman and Secretary, and Samuel Martin, '96.

Graphics—James R. Schick, '76, Chairman and Secretary.

ROLL OF STUDENTS, 1916–17

GRADUATE STUDENTS

Allan F. Bubeck, Dickinson, '13, Chemistry.
Lewis Aaron Smith, Lafayette, '16, Pedagogy.
Charles Garfield Eichlin, Lafayette, '13, Physics.
Wilbur Aaron Bryan, Lafayette, '15, Physics.

SENIOR CLASS, 1917.

Name.	Course.	Residence.	Room.
Walter Decoursey Addis	B.S.	Oak Lane	Φ Δ Θ
David Bowman Adler	Ph.B.	Yonkers, N. Y.	633 Parsons
Jay Warren Angle, Jr	Ph.B.	Hot Springs, Ark	Δ Υ
Irving LaFétra Arbeely	A.B.	Washington, D. C.	120 McC.
Robert Earle Bacon	Ph.B.	Bridgeton, N. J	Δ Υ
Irenaeus Prime Bartley	M.E.	Bartley, N. J	Ζ Ψ
William Clair Behney	Ph.B.	Lebanon	Φ Δ Θ
William Stanley Bell	C.E.	Cranford, N. J	Σ Ν
Frederick William Biltz	C.E.	Ashland	82 N.
Kenneth Merry Bixler	Ph.B.	Easton	206 Spring Garden
Roger Hunt Blake	A.B.	Trenton, N. J	98 McK.
Frederick Leo Brannon	Ph.B.	Hazleton	51 S.
Roland Wilbur Brown	B.S.	Aquashicola	34 S.
Charles Clare Brownmiller	Ph.B.	Shoemakersville	80 N.
John Kay Christmas	M.E.	Easton	Sullivan St.
Heston Rarick Cole	C.E.	Succasunna, N. J.,	908 Paxinosa
Earle Johnston Conover	Ph.B.	South River, N. J	35 S.
Harold Alanson Crane	Ph.B.	Phillipsburg, N. J., Home,	101 So. Main
Ralph Worthington Crane	Ph.B.	South Amboy, N. J	69 B.
Benjamin George Dann	C.E.	Beltsville, Md	Δ Τ Δ
Pardee Fullerton Day	Ph.B.	Hazleton	Θ Δ Χ
Louis Leon deSalignac	C.E.	Pompton Lakes, N. J.	82 N.
John Patrick Diamond	C.E.	Cynwyd	Δ Υ
Robert Frederick Dibble	Chem.	Valley Stream, L. I.,	230 McCartney
Paul Elliott Dodson	Ph.B.	Wilkes-Barre	633 Parsons
Robert Leslie Dunlap	E.E.	Easton	1032 Lehigh
Joseph Raymond Evans	Ph.B.	Eldred, N. Y.	131 McCartney
Joshua Grover Everard	Ph.B.	Wapwallopen	Δ Τ Δ

Name.	Course.	Residence.	Room.
Edwin Grone Eyerly, 2nd	Ph.B.	Danville	Σ N
Robert Arthur Farnam	B.S.	LaCrosse, Wis	Δ K E
Harold Davies Fernau	Ph.B.	Jeddo	Δ T Δ
William Voorhees Garretson	Ch.	Perth Amboy, N. J	23 S.
Fred Lewis Gerard	C.E.	Hampton, N. J	Σ X
William Elwood Gilbert	Ch.	Spring City	65 B.
Leo Alton Aloysius Gordown	Ph.B.	Phillipsburg, N. J.,	Home, 7 Heckman
Harold Crane Griffin	E.E.	Phillipsburg, N. J.,	Home, 159 Chambers
Joachim Isaac Gulick	A.B.	Whitehouse Sta., N. J.,	232 McC.
Fred Passmore Gutelius, Jr	C.E.	Moncton, N. B., Canada,	Φ K Ψ
Paul McCollum Hallam	B.S.	Washington, Pa.,	323 Hamilton
William Alfred Handwerk	Ch.	Northampton	163 E.
John Kinsey Hefferman	A.B.	Easton	256 Bushkill
Robert Leon Hefferman	C.E.	Easton	256 Bushkill
Raymond Walker Hill	A.B.	Metal	50 S.
Floyd Robinson Hoffman	B.S.	Califon, N. J	79 N.
Carl Edwin Houck	Ph.B.	Bangor	Σ N
Samuel McCoy Hunt	E.E.	Sussex, N. J	Φ Δ Θ
Russell John Hurd	C.E.	Pen Argyl	36 S.
Charles Heebner Ives	A.B.	Scranton	113 McK.
George Denis Kane	Ph.B.	Phillipsburg, N. J.,	Home, 224 Chambers
Harold Raudenbush Keeler	Ph.B.	Harleysville	633 Parsons
George Wilbur Kidney	C.E.	Easton	714 Cattell
Arnold George August Klosé	A.B.	Great Meadows, N. J	51 S.
Howard Franklin Koons	C.E.	Perth Amboy, N. J	51 S.
Israel Krohn	Ph.B.	Easton	698 Northampton
John Curry Lee	B.S.	Pottsville	Θ Δ X
Harper Ferguson Leeper	A.B.	Media	Δ K E
Frank Henry Lehecka	C.E.	Easton	110 Parker Ave.
Frederick Augustus Lehmann	E.E.	Washington, D. C.	130 McC.
Daniel Charles Lichtenwalner	Ch.	Tatamy	Home
Charles Edgar Lothrop	Ph.B.	Easton	East Paxinosa Ave.
Clarence Willard Lowden	Ph.B.	Delmar, Del	Σ N
David Lewis McAllister	M.E.	Newton, N. J	88 N.

NAME.	COURSE.	RESIDENCE.	ROOM.
Maxwell McKeen	Ph.B.	Easton	310 New
Harry Alexander MacFadden, Jr	E.E.	Hollidaysburg	Ζ Ψ
Carl Theodore Mack	E.E.	Easton	418 McC.
Henry Dusenbery Maxwell, Jr	M.E.	Easton	208 Spring Garden
Harry Smuller Meily, Jr	Ph.B.	Tyrone	Φ Δ Θ
Howard George Memory	M.E.	Maplewood, N. J	Δ Τ Δ
Fred Biesecker Merring	A.B.	East Stroudsburg	113 McK.
Ford Andrew Miller	Ph.B.	Easton	924 Butler
Redington Moore	M.E.	Leconia, N. H	Ζ Ψ
Donald Adam Mummert	A.B.	Harrisburg	Brd
Daniel Hawkins Overton, Jr	A.B.	Islip, N. Y	48 S.
Charles Marvin Pardee	B.S.	Hazleton	Θ Δ Χ
Carl George Paulson	Ph.B.	Greensburg	Φ Δ Θ
George Edwin Pidcock	C.E.	Bloomsbury, N. J	Θ Δ Χ
Joseph Bradley Quig	Ch.	Delaware, N. J	69 B.
James Herbert Quiri	C.E.	Easton	115 McC.
Harold Henry Rahn	C.E.	Kutztown	47 S.
Harry Lawrence Ramage	C.E.	Warwick, N. Y	175 E.
John Coffey Reese	Ph.B.	Shippensburg	115 S. 6th St.
Harry Victor Reiner	M.E.	East Orange, N. J	Ζ Ψ
Cecil Blair Rogers	Ph.B.	Sugar Run	149 P.
Bernard Rosenthal	B.S.	Wilkes-Barre	73 K.
Daniel LeRoy Ross	C.E.	Easton	1214 Spruce
Herman Bertram Sheporwich	Ph.B.	Wilkes-Barre	522 New
Warren Kretchting Sherman	A.B.	New Germantown, N. J.,	Prof. Youngman's
George Sellers Smith	M.E.	Latrobe	Φ Κ Ψ
Philip Charles Smith, Jr	C.E.	Easton	Sullivan
Sydney Griswold Smith	C.E.	Phillipsburg, N. J.,	Home, 97 So. Main
Earle Spader Snyder	B.S.	Atlantic Highlands, N. J.,	Δ Τ Δ
Arthur Raymond Bunting Stern	C.E.	Philadelphia	34 S.
Mortimer Menville Stocker	A.B.	Honesdale	35 S.
Paul Herbert Taylor	E.E.	Camden, N. J	Δ Υ
Frank Fisher Truscott	Ph.B.	East Stroudsburg	Δ Τ Δ
Allen Scott Turner, Jr	E.E.	Maplewood, N. J	Δ Κ Ε
Arthur Richard Walk	Ph.B.	Chambersburg	Φ Δ Θ
George Charles Watson	A.B.	Norton, Va	Α Χ Ρ

NAME.	COURSE.	RESIDENCE.	ROOM.
William Francis Wefer	A.B.	Brooklyn, N. Y	68 B.
Henry Stanley Greiss Welty	A.B.	Portland	Σ N
Stewart Means Wikel	E.E.	Marietta	81 N.
Alun Sylvanis Williams	Ph.B.	Wilkes-Barre	Σ X
Benjamin Crispin Williams	Ph.B.	Berwick	100 McK.
Jacob Benjamin Woehrle, Jr	A.B.	Wilkes-Barre	604 Walnut
Norman Howard Wolbach	E.M.	Easton	37 S. 13th
SENIORS			105

JUNIOR CLASS, 1918.

NAME.	COURSE.	RESIDENCE.	ROOM.
Eugene Henry Albright	C.E.	Mifflinburg	85 N.
Lewis Bower Allen	Ph.B.	Wilmington, Del	Δ K E
Edwin Rockerfeller Baldrige	B.S.	Hollidaysburg	Z Ψ
Gilbert Jamieson Banks	Ph.B.	Chambersburg	Φ Δ Θ
Norman Mitchell Bannerman	Ph.B.	Titusville, N. J	38 S.
Elvin Leon Barr	Ch.E.	Easton	1032 Berwick
Aaron Seibert Bauer	A.B.	Dorrauceton	37 S.
Richard Bennett Bechtel	C.E.	Trenton, N. J	38 S.
Guy Arthur Bensinger	A.B.	Ashland, Pa	147 P.
Bertine James Boyer	Ph.B.	Brodheadsville	47 S.
Lester Hill Britton	E.E.	Copper Hill, N. J	637 High
Thomas Franklin Burley, Jr	Ph.B.	Belvidere, N. J	232 Cattell
Arthur Chester Camovito	B.S.	Lakewood, N. J	A X P
Berthold Frank Condé	C.E.	Easton	225 Cattell
Edwin Roscoe Conklin	Ph.B.	Lakewood, N. J	87 N.
Frank Edward Coughlin	B.S.	Luzerne	Δ T Δ
William Leo Courson	Ph.B.	Picture Rocks	127 M.
Mumford Chamberlain Crossley	M.E.	Binghamton, N. Y	Φ K Ψ
Clifford Thomas Law Cryer	C.E.	Newark, N. J	611 High
Everett Kelsey Davey	M.E.	Rockaway, N. J	Δ Υ
Edgar Kirk Dawson	Ph.B.	West Cape May, N. J.,	129 M.
Charles Alvan Dimm	B.S.	Mifflinburg	Φ Δ Θ
Lewis Patrick Dolan	B.S.	Ogdenburg, N. J	Φ Δ Θ
Andrew Kenneth Dougall	B.S.	Maplewood, N. J	Δ K E
Samuel Douthert, Jr	M.E.	Newark, N. J	102 McK.
George Henry Drake	Ch.	Newark, N. J	151 P.
John Kilshaw Dunn	B.S.	New York, N. Y	Z Ψ
Arthur Serfass Eichlin	Ch.	Easton	1627 Northampton

NAME.	COURSE.	RESIDENCE.	ROOM.
William Leone Eldredge	B.S.	West Cape May, N. J.,	114 McK.
George Wyckoff Fleming	Ph.B.	Washington, N. J.	Home
Leeth Ivan Florey	A.B.	Pen Argyl	170 E.
Edwin Arnold Forrest	Ph.B.	Spring City	Σ N
Philip Frederick Forve	B.S.	Los Angeles, Cal	Z Ψ
Frank Royal Gammon	B.S.	Boston, Mass	Δ K E
Paul Staley Grant	A.B.	Oak Park, Ill.	633 Parson St.
John Fulton Grimm	Ph.B.	Newville	Φ K Ψ
Joseph Guzzetto	Ph.B.	Easton	123 South Third
Elbert Wilson Haldeman	A.B.	Danboro	319 McC.
Robert Forster Hare	Ph.B.	Altoona	Φ K Ψ
Jonathan Moore Harris	B.S.	Easton	723 Paxinosa
Harry Cyphers Hartung	E.E.	Phillipsburg, N. J.,	47 Washington St.
Hamilton Ritchie Hill	Ph.B.	Westbury, N. Y	Z Ψ
Harold Brekford Hofford	Ch.	Bloomington, Ill	Φ Γ Δ
Samuel Kenneth Hutchinson	A.B.	Stroudsburg	Prof. Youngman's
Ralph Cooper Hutchison	A.B.	Garden City, Kan.	91 McK.
John Benson Irvin, Jr	B.S.	Williamsport	X Φ
Charles Justus Itter, Jr.	C.E.	Hazleton	23 S.
Albert Thomas Jones	Ch.	Scranton	72 B.
Frank Smith Jones	C.E.	Delaware, N. J	Δ Υ
John Wright Kanehann	A.B.	Phillipsburg, N. J.,	Home, Delaware Park
Roy Buchanan Karn	Ch.	High Bridge, N. J	Home
Carleton Bannister Kidney	C.E.	Easton	714 Cattell
Alvan Ray Kirschner	Ph.B.	Hazleton	X Φ
Frank Joseph Klein	B.S.	Easton	204 St. Joseph
Walter Gehret Kleinspehn	Ch.	Reading	72 B.
Albert Seeger Kohl	Ph.B.	Newburgh, N. Y	Θ Δ X
Ernest Evans Kohl	A.B.	Maryd	635 High
Kenneth Farrington Kressler	Ph.B.	Easton	205 Madison
William Egbert Kressler	B.S.	Easton	205 Madison
Joseph Earl Lenhart	Ph.B.	Colmar	133 M.
Clarence Smaling Line	Ch.	Westtown, N. Y.	605 High
Irving Otto Lippman	Ph.B.	Newark, N. J	230 McC.
William Lash Lipps	E.E.	Mt. Vernon, N. Y	137 F.
Abram Lipson	Ch.	Newark, N. J	29 S.

NAME.	COURSE.	RESIDENCE.	ROOM.
James Russell Longstreet	M.E.	Manasquan, N. J.	108 McK.
Albert Wesley McKenney, Jr.	B.S.	Greensburg	Χ Φ
Charles Andrew Maloney	M.E.	Philadelphia	Δ Υ
Martin Marasco	Ch.	Easton	Prof. Hart's
John High Mecray	B.S.	Cape May, N. J.	120 McC.
Charles Samuel Messinger	A.B.	Easton	253 Bushkill
Marshall Rinker Metzgar	Ph.B.	Stroudsburg	45 S.
Hugh Stewart Millar	A.B.	Tamaqua	65 B.
Walter McKinley Miller	Ph.B.	Hazleton	16 S.
Frank Dewey Munroe	A.B.	Hazleton	147 P.
Harry Randolph Hull Nicholas, Jr.	B.S.	Flanders, N. J.	Θ Δ Χ
Charles Gerald Palmer	C.E.	Pen Argyl	63 B.
Robert Euart Park, Jr.	M.E.	Jersey City, N. J.	Ζ Ψ
Owen Curtis Pearce	Ph.B.	Manasquan, N. J.	139 F.
David Oscar Emanuel Peterson	Ch.	Perth Amboy, N. J.	50 S.
Walter B. Petry	Ph.B.	Trenton, N. J.	65 B.
John Heber Phillips	C.E.	Steelton	Brd.
Peter Duglass Pittenger	Ph.B.	Easton	R. D. No. 3
Porter Grier Polk	B.S.	Danville	Ζ Ψ
James Madison Porter, Jr.	B.S.	Easton	53 No. Third
James Lewis Prescott	B.S.	Passaic, N. J.	120 McC.
Earl E. Purcell	A.B.	Pen Argyl	89 N.
Edward Christopher Rafferty, Jr.	E.E.	Easton	1015 Butler
Douglass Odenwelder Reed	C.E.	Easton	609 High
Spencer Harris Reed	Ph.B.	Tonkhannock	49 McC.
Orion Hughes Reeves	Ph.B.	West Cape May, N. J.,	114 McK.
Fred Elliott Renn	Ch.	Shamokin	38 S.
John James Reynolds, Jr.	B.S.	Phillipsburg, N. J., Home,	413 So. Main
Howard Kenneth Riegel	E.E.	Easton	56 So. Front
Jacob Henry Ritter	E.E.	Weatherly	88 N.
William Wallace Robertson	C.E.	Washington, D. C.	Δ Τ Δ
Louis Nicholas Rocca	A.B.	Easton	Φ Γ Δ
Nicholas Ralph Rothermel, Jr.	B.S.	Bernharts	Σ Ν
Paul Elwood Sandt	C.E.	Easton	506 McC.
Millard Russell Sarson	E.E.	Washington, N. J.,	R. D. 1, P'burg, N. J.

NAME.	COURSE.	RESIDENCE.	ROOM.
Thomas Samuel Searles	C.E.	Wilmington, Del	Α Χ Ρ
Hoyle Gilman Seeley	Ch.	Scranton	139 F.
Monroe Holmes Shoemaker	M.E.	Elmira, N. Y	Θ Δ Χ
Charles Theodore Siebert, Jr	M.E.	Pittsburgh	Χ Φ
Charles Daniel Smeltzer	Ph.B.	Reading	118 McK.
Kenneth Milton Smith	B.S.	Latrobe	Φ Κ Ψ
Rayburn F. Smith	C.E.	Mansfield	Φ Δ Θ
Walter Thomas Spry	Ch.	Plymouth	110 McK
Edwin Smyser Strawbridge	Ph.B.	York	Ζ Ψ
Hugh Oscar Tompkins	Ph.B.	Ocean Grove, N. J	Φ Δ Θ
Nathaniel Taylor Trembath	Ph.B.	Kingston	Φ Γ Δ
William Berner Ulmer	B.S.	Pottsville	Θ Δ Χ
Frederick William Vigelius	M.E.	Easton	342 Cattell
John Brennen Edward Vilsack	B.S.	Pittsburgh	Θ Δ Χ
Laurens Washington Wallazz	E.E.	Easton	130 McC.
Albert Mathis Weber	C.E.	Washington, D. C.	116 McK.
John Ambrose Weldon	Ph.B.	Watertown, N. Y	Ζ Ψ
J. Ludlow White	C.E.	Easton	105 Monroe
Thomas Willever	B.S.	Phillipsburg, N. J., Home,	1083 S. Main
William Sampson Williams	E.E.	Minersville	116 McK.
Howard Sidney Willson	Ch.	Andover, N. J	633 Parsons
Urbanus Short Wirebach	Ph.B.	Easton	625 Berwick
Carl Robert Wolbach	C.E.	Easton	37 So. 13th
William Moodie Woodruff	E.E.	Trenton Junction, N. J.,	Χ Φ
Harold Leslie Woods	M.E.	Easton	103 Parker Ave.
David John Zehner	C.E.	Easton	27 N. 8th St.

JUNIORS.. 125

SOPHOMORE CLASS, 1919.

Harrison Kingsland Ackerman, Jr.	Ph.B.	Paterson, N. J	14 S.
Noel Constant Albertson	Ph.B.	Bridgeton, N. J	117 McK.
Algert Daniel Alexis	C.E.	Minersville	108 McK.
Charles Spencer Allen	E.E.	Easton	909 Northampton
William Hunter Anderson	B.S.	Pittsburgh	Θ Δ Χ
Harry Welling Barrick	C.E.	Trenton	49 S.
Harman Edward Baugh	C.E.	Mt. Holly, N. J	228 McC.

Name.	Course.	Residence.	Room.
William Raymond Baur	B.S.	Wilkes-Barre	Φ Κ Ψ
Herbert Campbell Beatty	Ph.B.	Hoboken, N. J	Δ Υ
Donald Allen Behney	Ph.B.	Lebanon	Φ Δ Θ
George Hornbeck Bell	B.S.	Port Jervis	117 McK.
Thaddeus Andrew Biddle	B.S.	Altoona	Φ Κ Ψ
Andrew Hunlock Billings	B.S.	Forty-Fort	Ζ Ψ
William Arthur Bissell	Ph.B.	Scranton	Φ Γ Δ
Jesse Wellington Booth	C.E.	Middletown, N. Y	145 P.
Alson Brandes	A.B.	Newark	29 S.
Donald Broadbent	P.M.	Easton	686 Lehigh
Ira Tripp Broadbent	B.S.	Scranton	Ζ Ψ
Walter Middleton Brown	B.S.	Lakewood, N. J	Α Χ Ρ
Alexander McWhorter Bruen	Ch.E.	Belvidere, N. J	Belvidere
Adolph Albert Buechner	A.B.	Ozone Park, N. Y	155 E.
Francis Charles Caracciolo	Ph.B.	Mayfield	84 N.
Robert P. Carr	Ch.E.	East Orange, N. J	Χ Φ
Francis Arndt Chidsey	Ch.	Easton	133 Bushkill
Everett Wallace Clough	Ph.B.	Middleboro, Mass	Δ Κ Ε
Elston Cortright Cole	Ph.B.	Stroudsburg	45 S.
George Bryan Cook	E.E.	Manasquan, N. J	102 McK.
Arthur Alexander Cope	A.B.	Hamburg	33 S.
Alonzo Fisher Corby, Jr	Ph.B.	Nesquehoning	Φ Γ Δ
Ellsworth Hiester Croll	A.B.	Easton	1217 Spruce
Winthrop Parker Culver	E.M.	Montclair, N. J	Δ Υ
Gregory Francis Curtin	M.E.	Cheshire, Mass	703 High
Abel Davis DeCant	B.S.	Carthage, N. Y	Ζ Ψ
William Milford Davis	Spec.Ch.E.	Cleveland, O.,	226 Porter
Herman Otto Dietz	P.M.	Washington, D. C	39 S.
Alva Charles Dinkey	B.S.	Pittsburgh	Θ Δ Χ
James Ledward Dobson	C.E.	Philadelphia	Δ Τ Δ
Isaac Hager Dorland	Ch.	High Bridge, N. J	Home
Leslie Fremont Ellis	B.S.	Maplewood, N. J	Ζ Ψ
Samuel Moffitt Ellis	E.E.	Philadelphia	Φ Γ Δ
Robert G. Ernst	C.E.	Hoboken, N. J	Δ Υ
Gerard Magella Fahey	A.B.	Scranton	Φ Γ Δ
James Fairclough	E.E.	Paterson, N. J	135 P.
Charles M. Fehr	Ch.	Easton	746 Milton A.
Ferdinand Milton Ferguson	P.M.	New York, N. Y	Δ Υ
John Lawrence Fitzgerald	C.E.	Passaic, N. J	16 S.

NAME.	COURSE.	RESIDENCE.	ROOM.
Thomas Austin Forbes	C.E.	Saltsburg	100 Cattell
William Arthur Frack	Ph.B.	Nazareth	Home
Mark N. Fredenburg	Sp.	Newton, N. J.	322 Porter
William Henry Galbreath, Jr.	A.B.	Delta	156 E.
Philip Reading Gebhardt	B.S.	Clinton, N. J	79 N.
Frederick Ernst Gerlock	M.E.	Scranton	146 P.
Russell Lynn Godshalk	E.E.	Easton	7 N. 14th
Carleton K. Gradwohl	Ch.E.	Easton	206 McC.
Edward Dean Griffith	A.B.	Plymouth	Φ Γ Δ
Herman Grollman	Ch.E.	Easton	105 N. 7th
Walter Alexander Groves	A.B.	Germantown	37 S.
William Frank Guntner	C.E.	Philadelphia	138 F.
Leon William Hackett	Ph.B.	High Bridge, N. J	14 S.
Ralph William Hackett	Ch.	Trenton, N. J	Δ Τ Δ
Milton Otto Hager	C.E.	Buffalo, N. Y	627 High
Joseph Norman Heil	C.E.	Easton	106 Cattell
Hobart Daniel Heisler	A.B.	Orwigsburg	158 E.
William Orme Hiltabidle, Jr.	C.E.	Washington	43 S.
Robert Watson Hodgson	Ch.E.	Scranton	77 K.
Charles Clayton Hollenbach	Ch.E.	Reading	85 N.
Arthur Fox Holler	B.S.	Hummelstown	Δ Τ Δ
Clifton John Hopf	B.S.	Elizabeth	86 N.
Orion Cornelius Hopper	A.B.	Woodhaven, N. Y	64 B.
Robert Louis Houck	B.S.	Easton	27 S. 9th
Sylvester VanSlyke Howell	B.S.	Clinton, N. J	Φ Δ Θ
Alvan Smith Hutchinson	C.E.	Oyster Bay, N. Y	Φ Δ Θ
Louis Frederick Huttenlocher	Ph.B.	Patchogue, N. Y	Φ Γ Δ
Joseph Henry Jackson	Sp.	New York, N. Y	Φ Κ Ψ
John Clement Justin	A.B.	West New York, N. J.	150 P.
Paul Lawrence Keating	C.E.	Northampton, Mass.	Φ Γ Δ
John Spencer Kelly	B.S.	Albany, N. Y	Χ Φ
Paul Darlington Kern	C.E.	Easton	756 Washington
Edgar Laubach Kline	M.E.	Martins Creek	Home
John Harold Kottman	M.E.	Maplewood, N. J	Χ Φ
Kenneth Stewart Kuhn	B.S.	Easton	326 N. 9th
James Milton Lawson	B.S.	Trenton, N. J	Φ Γ Δ
Henry Stanley Lehr	C.E.	Easton	1144 Butler
Robert Hamilton Lewis	Ch.	Scranton	Δ Υ
Benjamin Chidlaw McCabe	B.S.	Duluth, Minn	Φ Κ Ψ
Jesse Ezra McFall	A.B.	Flicksville	162 E.

NAME.	COURSE.	RESIDENCE.	ROOM.
William Francis McNally	B.S.	Easton	111 N. 2d
Charles McVeigh	Ph.B.	Easton	19 S. 12th
William John McWilliams	Ph.B.	Easton	513 Hamilton
James G. Mitchell MacCartney	A.B.	Altoona	Z Ψ
Charles Stewart MacNeal	A.B.	Hazleton	Ω Δ Φ
Donald VanMater Magee	E.E.	Easton	608 Meixsell
Richard Godfrey Mann	C.E.	Succasunna, N. J.	Δ T Δ
Emory Frederick Marsiglio	Ch.E.	Torrington, Conn.	105 McK.
Frank Fred Martin	M.E.	Easton	665 Spring Garden
Joseph Edward Mitinger	Ph.B.	Greensburg	Φ Δ Θ
William Leo Morrison	B.S.	Altoona	Φ K Ψ
Julius Naab	E.E.	Easton	128 Kleinhans A.
Willard Odenwelder	B.S.	Easton	45 S. 4th
Gwilym Emyr Owen	Ph.B.	Scranton	44 S.
Sutherland Palmer	B.S.	St. George, N. Y.	Θ Δ X
John Leslie Parker	Ph.B.	Paterson, N. J.	33 S.
William C. Phelps	B.S.	East Orange	X Φ
Charles Edward Prescott	B.S.	Passaic	120 McC.
George Thomas Price, Jr.	B.S.	Pittsburgh	711 High
George Flemming Pursel	Ch.	Easton	303 Bushkill
John Hagerty Pursel	Ph.B.	Phillipsburg, N. J.,	Fairview Hts.
Courtenay Lawrence Quick	E.M.	Dingman's Ferry	87 N.
Paul Frederick Regenfuse	Ch.E.	Reading	164 E.
Dill Brownell Register	Ph.B.	Bismark, N. D.	X Φ
Henry George Frederick Richter	E.E.	Easton	436 Northampton
David William Roberts	A.B.	Scranton	146 P.
John McPherson Robertson	B.S.	Shippensburg	66 B.
William Edwin Rosenheim	B.S.	Passaic, N. J.	103 McK.
John Rosevear	Ch.	Hazlet, N. J.	62 B.
Frank Wilson Ross	E.E.	Easton	705 Coleman
Jacob Bergen Rue, Jr.	C.E.	Red Bank, N. J.	Δ K E
George Willis Rundle	B.S.	Easton	43 N. 8th
Chauncey Taylor Rush	B.S.	Stratford, N. J.	166 E.
Frederick Callen St. Clair	A.B.	Indiana	70 B.
James Raymond Sampson	A.B.	Philadelphia	102 McK.
William Lack Sampson	Ch.E.	Scranton	Σ X
Ian Grant Scott	Ph.B.	Ambler	120 McC.

Name.	Course.	Residence.	Room.
John Frew Scott	M.E.	Pittsburgh	Χ Φ
William Allis Serfass	Ph.B.	Easton	126 Reeder
Charles Bowlby Sharp	M.E.	Phillipsburg, N. J.,	95 Summit A.
Edward Arthur Sherlock	P.M.	Auburn, N. Y	Δ Τ Δ
Grier Moore Shotwell	Ph.B.	Indianapolis, Ind	Δ Τ Δ
Lawrence L. Smith	B.S.	Belvidere	Home
David John Spratt	A.B.	Philadelphia	37 S.
Roy Fields Stanton	Ph.B.	Newburgh, N. Y	155 E.
Mark G. Stern	Ch. E.	Reading	159 E.
Frank Edwin Stier	E.E.	Easton	154 S. 6th
Russell Steward Stofflet	Ch.	Pen Argyl	228 McC.
Meriam Hollister Swan	M.E.	Passaic, N. J	Ζ Ψ
Frank Benjamin Swartwont	E.E.	Huguenot, N. Y	27 S.
Benjamin Willard Tague	Ph.B.	Scranton	75 K.
Frank Tamborelle, Jr	C.E.	Hoboken, N. J	120 Porter
William Wellington Taylor	Ph.B.	Scranton	75 K.
George Lincoln Townsend	M.E.	Washington, D. C	Θ Δ Χ
Lee Guard Treible	B.S.	Wilkes-Barre	Δ Τ Δ
Frank Curtis Trubee, Jr	B.S.	Derby, N. Y	Φ Κ Ψ
Howell Muirheid VanCleve	Ch.	Buffalo, N. Y	Δ Υ
Russell VanHorn	E.E.	Trenton, N. J	609 High
Jay Calvin VanKirk	Ph.B.	West Newton	516 New
George Charles Warner	Ph.B.	Weatherly	Χ Φ
Jesse Beadle Warren	B.S.	DuBois	138 F.
Peter Dow Webster	A.B.	New Haven, Conn	64 B.
George Ernest Welde	B.S.	New York, N. Y	Δ Τ Δ
Franklin Seymur Weston	Ph.B.	Passaic, N. J	Φ Κ Ψ
John Ellsworth Williams	Sp.	Portsmouth, O	Φ Κ Υ
James Clinton Wolfe	P.M.	Bloomfield, N. J	Δ Υ
Wesley Crook Wolfinger	E.E.	Easton	1410 Northampton
George Transue Woodring	Ph.B.	Easton	825 Lehigh
Donald Ramsey Young	A.B.	Macungie	435 McC.
Thomas Cummings Zulick, Jr	Ph.B.	Easton	New and Porter

SOPHOMORES 156

FRESHMAN CLASS, 1920.

Dudley Clifton Agar	Ch.E.	Newark, N. J	117 McK.
Charles Howard Aitken	C.E.	Moorestown, N. J	98 McK.

NAME.	COURSE.	RESIDENCE.	ROOM.
Bartholomew Marinus Frank Albanese	Ph.B.	Paterson, N. J	Φ Γ Δ
William C. Albertson, Jr	Eng.	Belvidere, N. J	Home
William Harvey Albright	M.E.	Hampton, N. J	131 M.
Gavin Alexander, Jr	B.S.	Paterson, N. J	Φ Γ Δ
Harold Francis Alexander	M.E.	Westfield, N. J	62 B.
William Davies Amos	A.B.	Plymouth	———
Winfield Scott Angus	B.S.	Newark, N. J	431 Clinton
Robert Elias Bachman	B.S.	Hazleton	99 McK.
Selers Hoffman Barnett	B.S.	Mt. Alverno	Φ Γ Δ
William Barnett, III	B.S.	Mt. Alverno	Φ Γ Δ
Donald Hemphill Baum	Eng.	Pittsburgh	Φ Κ Ψ
Howell Muirhead Becht	Ph.B.	Harrisburg	Χ Φ
James Rockwood Beers	P.M.	Weatherly	109 McK.
Paul Regis Blizzard	M.E.	Alpha, N. J	Home
Christopher Henry Bobbe	Ch.	Hoboken, N. J	88 N.
Samuel Louis Bodine	B.S.	Flemington, N. J	76 K.
Kenneth Jawler Bridges	B.S.	New York, N. Y	Ζ Ψ
Donald Alexander Brown	M.E.	Ocean Grove, N. J	152 P.
Shellman Handy Brown	B.S.	Easton	128 Pierce
John Zimmerman Burket	E.M.	Greensburg	609 High
Robert Leroy Casler	B.S.	South Orange, N. J	143 P.
Richard Stark Chidsey	B.S.	Easton	133 Bushkill
Charles Gillespie Clark	M.E.	Titusville	159 E.
Edward Herbert Conklin	B.S.	Madison, N. J	142 P.
Lawrence Harvey Cook	Ch.E.	Stroudsburg	116 McK.
Francis Whiley Cortright	B.S.	Beverly, N. J	140 F.
Charles Augustus Cowley	M.E.	Malden, Mass	Χ Φ
Charles Francis Crossley	Ch.	Dowingtown	111 McK.
Cecil Idell Crouse	A.B.	Island Heights, N. J.,	405 Monroe
Alvan Cushman	Ph.B.	Brookline, Mass	Δ Κ Ε
John Bloss Davenport	M.E.	Roselle, N. J	121 McK.
George Allen Davis	B.S.	Scranton	144 P.
John Oberly Davis	C.E.	Easton	525 East Ave.
Alfred Colville DeKay	B.S.	Cranford, N. J	342 Cattell
Franklin Archer Develin	Ph.B.	Camden, N. J	Δ Υ
Robert Russell Dickey, Jr	B.S.	Dayton, O	———
Philip A. Diefenderfer	Ch.	Lehighton	Σ Ν
Herman Frank Dippé	Ch.	Wilkes-Barre	118 McK.

NAME.	COURSE.	RESIDENCE.	ROOM.
Edward Siebert Disbrow	E.E.	Manasquan, N. J.	32 Cattell
Roland Doan	B.S.	Berwick	78 K.
John Malcolm Dowling	B.S.	Pittsburgh	Φ Κ Ψ
Paul Frederick Drake	B.S.	Phillipsburg, N. J.,	85 Summit Ave.
Robert Droescher, Jr.	B.S.	Cranford, N. J.	Θ Δ Χ
Robert Sidney Dubois	B.S.	Yonkers, N. Y.	Χ Φ
William C. Duckham	Ch.E.	Madison, N. J.	Δ Τ Δ
Charles Wilson Durr	B.S.	Newark, N. J.	117 McK.
Paul Reginald Evans	Ph.B.	Eldred, N. Y.	131 McC.
Wilbur M. Evans	C.E.	Norristown	130 M.
John Eyerman, Jr.	Ph.B.	Easton	56 N. 4th
William Donald Eynon	P.M.	Easton	800 Spring Garden
William Henry Fackenthal	Ph.B.	Easton	120 N. 7th St.
Carl Landis Fehr	M.E.	Easton	602 Clinton
Stanley James Fehr	Ph.B.	Tatamy	Home
Arthur Edward Fenstermacher	E.M.	Easton	1 Nevins Ter.
Paul Jerrold Feuchtwanger	B.S.	Madison, N. J.	Θ Δ Χ
William Kane Figley	B.S.	Canton, O.	325 Hamilton
James Hampton Fithian, Jr.	A.B.	Bridgeton, N. J.	97 McK.
Frederic Joseph Fleron	B.S.	Trenton, N. J.	Δ Τ Δ
James Alden Fownes	B.S.	Pittsburgh	Φ Κ Ψ
Edward Jay Fox, Jr.	Ph.B.	Easton	336 Reeder
Horace Russell Freeston	Ph.B.	Glenside	605 High
Richard Thomas Frick	B.S.	Sewickley	Φ Κ Ψ
Charles Frederick Fryling	Ph.B.	Newark, N. J.	132 M.
Harry Phillip Fuhrmann	Ch.E.	Shamokin	Σ Χ
John Jacob Gambal	Ph.B.	Olyphant	84 N.
Gila Gano	B.S.	Woodhaven	94 McK.
Norman Carlton Gardner	Ch.	Newark, N. J.	28 S.
William Robert Gellatly	B.S.	Pittsburgh	Θ Δ Χ
Robert J. O. Gicking	Sp.	Hazleton	230 McC.
William Spargo Giles	E.E.	Royalton, Ill.	231 Cattell
Howard Mervin Gordon	B.S.	Oil City	323 Hamilton
Paul Lawrence Grambs	B.S.	Bismarck, N. D.	Χ Φ
Earl Leslie Griggs	Ph.B.	Spuyten Duyvil, N. Y., City	149 P.
John Francis Gooel	B.S.	Newark, N. J.	27 S.
Earl Shuman Gruver	E.M.	Easton	720 Spring Garden
William Gunning, Jr.	Ch.	Easton	623 Seitz Ave.

Name.	Course.	Residence.	Room.
Lyle Hagaman	B.S.	Lakewood, N. J	133 M.
Oscar Warren Hamilton	B.S.	Brooklyn, N. Y	Φ K Ψ
William Judson Hampton, Jr	C.E.	Butler, N. J	Home
Norman Brown Hardy	B.S.	Pittsburgh	X Φ
Ellis Francis Harlow	B.S.	Plymouth, Mass	Δ Υ
Harry August Hartman	C.E.	Trenton, N. J	627 High
James Hurt Wilson Hay	M.E.	Easton	15th & Northampton
Seward Brenneman Hays	Ph.B.	Munhall	62 B.
Charles Vankirk Henry	P.M.	Washington, Pa.,	323 Hamilton
Gregory Herman	Ph.B.	Wilkes-Barre	154 E.
James Morton Herring	A.B.	Pen Argyl	33 S.
Victor M. Heyden	E.E.	Weatherly	105 McK.
Fred Clemens Hill	C.E.	Easton	345 Ferry
Russell Parker Hill	B.S.	Bethlehem	Δ K E
Edmund Thomas Hoch	P.M.	Freeland	44 S.
Edwin Simeon Hogg	C.E.	Wilkes-Barre	107 McK.
William Murray Houser	B.S.	Altoona	Φ K Ψ
Henry Clay Hunt, Jr	M.E.	Sussex, N. J	Φ Δ Θ
Joseph S. Hunt	Ph.B.	Newton, N. J., R. D. No. 2	158 E.
Hubert Hutchinson	B.S.	Newark, N. J	142 P.
Ralph Marshall Hutchison	A.B.	Bangor	43 S.
James Nelson Hynson	Ph.B.	Lebanon	Φ Δ Θ
Robert Leslie Isaacs	A.B.	Collingswood, N. J.	101 McK.
Walter A. Jayme	M.E.	Pittsburgh	Φ K Ψ
George Parbury Pollen Jewett	B.S.	Nyack, N. Y	X Φ
Hosmer Franklin Johnson	Ph.B.	Tsinan Shantung Prov., China,	45 S.
Aneurin Jones	Eng.	Scranton	121 McK.
Richard Thomas Jones, Jr	Sp.	Philadelphia	Σ X
William Irvin Kelchner, Jr	P.M.	Camden, N. J	41 S.
Ogden Alford Kelley	P.M.	Washington, D. C	143 P.
Edward M. Kennedy	E.E.	Dover, N. J	131 McC.
Robert Rollins Kenworthy	Ch.E.	Philadelphia	77 K.
Walter Kerst	P.M.	Jersey City, N. J	10 S.
Edward Woodhull Ketcham, Jr	Ph.B.	East Orange, N. J	Θ Δ X
Frederick Charles Kirkendall, Jr	B.S.	Wilkes-Barre	107 McK.
Guy Soulliard Klett	Ph.B.	Lebanon	101 McK.
Lewis Woodward Knerr	Ch.E.	Cape May, N. J	132 M.

NAME.	COURSE.	RESIDENCE.	ROOM.
Howard Albert Kosman	A.B.	Riegelsville	Home
John Francis Kowalewski	C.E.	Minersville	109 McK.
Frederick Hartman Krick	C.E.	Richmond Hill, N. Y	Χ Φ
Austen Randolph Lake	B.S.	Buffalo, N. Y	Δ Κ Ε
Robert Clark Laycock	Ph.B.	Kingston	K.
Ray Godrey Lehman	C.E.	Monico, Cal	Φ Γ Δ
Allison Russell Leininger	B.S.	Easton	1407 Washington
Stephen White Lenahan	B.S.	Wilkes-Barre	Δ Τ Δ
Harry Thomas Lennen	M.E.	Easton	136 N. 13th
DeForest Motter Lescure	Ph.B.	Harrisburg	Δ Κ Ε
John Illig Lewis	M.E.	Mahonoy City	Φ Γ Δ
Karl Burns Sitzelman	M.E.	Sayre	301 Cattell
Wendell Phillips Loux	Ph.B.	Clementon, N. Y	163 E.
William Albert McCollough	Ch.E.	Easton	930 Lehigh
John Franklin McCoy, Jr	Ph.B.	Sussex, N. J	611 High
Kenneth Maxwell McDonnell	Ph.B.	Scranton	83 N.
David Barber McKeever	A.B.	Newburgh, N. Y	157 E.
William McKinny McKelvy	B.S.	Pittsburgh	Θ Δ Χ
H. James McLellan	Ph.B.	McKeesport	100 McK.
John Pierce McMahon	Eng.	Washington, N. J	Home
Chester William McNally	B.S.	Jersey City, N. J	10 S.
Donald Francis McNamee	C.E.	Plainfield, N. J	165 E.
Robert Stuart MacAlister	P.M.	Camden, N. J	226 Porter
Alexander Francis MacDonald	M.E.	Brooklyn, N. Y	74 K.
George Kemerer MacFetridge	A.B.	Allentown	Ω Δ Φ
James Bernard Maguire	Ch.E.	Plains	———
George Edwin Major	B.S.	Lakewood, N. J	133 M.
Adolph Louis Marcolina	C.E.	Hazleton	605 High
Edward Doak Martin	Ch.	Wilmington, Del	45 S.
Ross Alsip Mask	Ch.	Plymouth	90 N.
John Kern Mathis	B.S.	Moorestown, N. J	106 McK.
Harry Carson Middleton, Jr	C.E.	Moorestown, N. J	136 F.
William Alexander Millar	M.E.	Camden, N. J	Δ Υ
George Lane Miller	C.E.	Pen Argyl	36 S.
Robert Hastings Miller	M.E.	Easton	300 N. 11th
Samuel Miller, Jr	C.E.	Washington, D. C	Δ Υ
John Herbert Moore	Ph.B.	Lyswen	314 McC.
Aston Hugh Morgan	B.S.	Wilkes-Barre	Δ Τ Δ
Harry Robson Morgan	E.E.	Minersville	106 McK.
Edward Eugene Morris	Ch.E.	Kittanning	Χ Φ

NAME.	COURSE.	RESIDENCE.	ROOM.
Daniel Kenneth Morrison	B.S.	Newport, R. I.	93 McK.
James Gilbert Morrison	Ch.E.	Easton	145 James
William Abraham Morrow	Ch.	Reading	164 E.
George Sherman Mott, Jr.	B.S.	Scranton	709 High
Ralph Alton Moyer	E.E.	Topton	92 McK.
Francis John Moylan	M.E.	Scranton	136 McC.
Roy Stanley Murphy	B.S.	Phillipsburg, N. J.,	193 Summit Ave.
Harold Thomas Murray	B.S.	Chicago, Ill.	230 McC.
Frank Nealis	M.E.	Scranton	136 McC.
Kenneth Edward Nicholson	P.M.	Manistique, Mich.	Σ X
Russell Winthrop Park	C.E.	Easton	114 N. 3d
Frank Ellsworth Parkhurst, Jr.	B.S.	Wilkes-Barre	Δ Υ
Frank Ford Patterson, III	Ph.B.	Camden, N. J.	Δ Υ
Frank Linton Patterson, Jr.	M.E.	Brooklyn, N. Y.	140 F.
James Allen Pentz	B.S.	Philadelphia	Δ K E
George Dewey Phennicie	P.M.	Donora	115 McK.
Willis Eugene Plack	Ph.B.	Philadelphia	122 McK.
Adam Harleigh Plasket	Ch.	Moorestown, N. J.	98 McK.
Louis Augustus Pollock	C.E.	Hazleton	70 B.
Charles Clifford Porter, Jr.	B.S.	Greensburg	Φ Γ Δ
Sanford Hubbell Potter	B.S.	Buffalo, N. Y.	Δ K E
Harry Campbell Preston	Ch.E.	New York, N. Y.	Θ Δ X
Ralph Wallace Prout	Ph.B.	Quincy, Mass.	Σ X
Stuart Elnathan Prutzman	B.S.	Palmerton	81 N.
John Frank Rader	Eng.	Easton	231 Kleinhans
Hilton Nicks Rahn	M.E.	Kutztown	607 High
James Wallace Raynolds	Ch.E.	Omaha, Neb.	Δ K E
Philip Heil Reagan	M.E.	Easton	306 Cattell
Theodore Reichbaum	Ph.B.	Pittsburgh	158 E.
Walter Earl Reid	Ch.	Ocean Grove, N. J.	152 P.
Harold E. Reinmiller	B.S.	Hazleton	70 B.
Earl Naftzinger Reinsel	A.B.	Hamburg, R. D. No. 1	45 S.
John Hostetter Reist	B.S.	Mt. Joy	115 McK.
Charles Willis Richards	M.E.	Easton	5 So. 11th
Edgar Charles Richardson	M.E.	Cape May, N. J.	129 M.
Robert Lloyd Roberts	A.B.	Marion Center	157 E.
Walter Clement Roseberry	M.E.	Easton	688 Lehigh
Simon Raymond Rusiackas	C.E.	Minersville	150 P.
William E. Russell	B.S.	Dorchester, Mass.	512 High

NAME.	COURSE.	RESIDENCE.	ROOM.
Charles George Schober	Eng.	Newark, N. J	611 High
Philip Frank Schoch	M.E.	Mt. Joy	———
John Sanders Scott	Ph.B.	Media	Δ K E
Charles Frederick Seeley, Jr	Ph.B.	Williamstown, Mass.	Θ Δ X
Walter M. Sheahan	Ph.B.	New Haven, Conn.	120 Porter
George Edwin Shetrone, Jr	Sp.	Easton	128 N. 8th
Raymond Powell Shirer	Ch.E.	Easton	901 McC.
Clayton Stevens Shoemaker	Eng.	Elmira, N. Y	15 S.
Guy Simmons Shoemaker	Eng.	Elmira, N. Y	15 S.
Raymond Spencer Shortlidge	E.E.	Landenberg	148 P.
Clyde Herbert Skinner	A.B.	Easton	910 Spring Garden
Amos Clark Smith	B.S.	Phillipsburg, N. J.,	21 Bennett St.
Guyon Augustus Smith	Ph.B.	New Oxford	122 McK.
Marquis McElroy Smith	Ph.B.	Scottdale	Θ Δ X
Walter Washington Smith	B.S.	Glen Garden, N. J	131 M.
Harold Collmar Snyder	B.S.	Jersey City, N. J	Δ K E
Leroy Foster Sost	Eng.	Trenton, N. J	627 High
George Gilland Steele	Sp.	West Pittston	Δ T Δ
Edmund Duxbury Steelman	C.E.	Trenton, N. J	Δ T Δ
Robert H. Stroh	P.M.	Forty-Fort	115 McK.
Harry Ashley Sutton	E.E.	Annandale, N. J	76 K.
Russell Franklin Sutton	M.E.	Hellertown	Home
William Hooper Thaxter, Jr	Sp.	Falmouth, Me	Δ K E
Daniel Russell Thomas	B.S.	Chicago Heights, Ill.	136 McC.
William Leland Thompson	B.S.	East Liverpool, O	78 K.
James Wayne Tomb	Ph.B.	Indiana, Pa	49 McK.
Charles Kenneth Ulsh	A.B.	Millerstown	148 P.
William Reed Usher	A.B.	Freeland	44 S.
Abdol Hamid Khan Vakeel	B.S.	Senneh, Persia	Φ Γ Δ
Lotzi Joseph Vecercusky	B.S.	Freeland	44 S.
Milton Abram Vreeland	E.E.	Matawan, N. J	97 McK.
Thomas H. Wallace	B.S.	Clearfield	323 Hamilton
Joseph Richard Walsh	Ch.	Newark, N. J	28 S.
Willard Warne	Ph.B.	Philadelphia	Σ X
Harry Benson Watton	B.S.	Oak Lane	Δ Υ
Frank Lowrie Weaver	M.E.	Washington, D. C	12 S.
John Roset Welles	Ch.E.	Wyalusing	Δ K E
Edwin Donald White	Ph.B.	Wayne	Θ Δ X
Thomas Myron Williams	M.E.	Wilkes-Barre	95 McK.

Name.	Course.	Residence.	Room.
John Forman Godley Williamson	Ch.	Easton	935 Jackson
John Yetter Wills	B.S.	Duncannon	Δ Υ
William Kenneth Wilson	Ch.	Easton	111 Parson
Martin Owen Wolbach, Jr	M.E.	Easton	37 S. 13th
George Edgar Wolf	C.E.	Highspire	1112 Washington
Avery Royce Wolfe	M.E.	Buffalo, N. Y.	705 High
Leonard David Wood	B.S.	New York, N. Y.	223 McC.
Harry Betz Wright	C.E.	Easton	184 Charles
James Nightingale Wright	Ph.B.	Paterson	14 S.
Charles Edwin Young	Ph.B.	Newcastle	Φ Δ Θ
Bruce Rexford Zeiser	Ph.B.	Wilkes-Barre	99 McK.
FRESHMEN			244

CLASSIFICATION BY RESIDENCE (UNDERGRADUATES)

Arkansas	1	Maryland	1	Ohio	5
California	1	Massachusetts	11	Pennsylvania	353
Connecticut	3	Michigan	1	Rhode Island	1
Delaware	5	Minnesota	1	Virginia	1
Dist. of Columbia	8	Nebraska	1	Wisconsin	1
Illinois	5	New Hampshire	1		
Indiana	1	New Jersey	168	Canada	1
Kansas	1	New York	52	China	1
Maine	1	North Dakota	2	Persia	1

SUMMARY

Courses	Seniors	Juniors	Sophomores	Freshmen	Total
Graduate	...	...	...	...	4
Bachelor of Arts	17	13	20	14	63
Bachelor of Philosophy	34	32	30	41	137
Bachelor of Science	9	27	34	72	142
Pre-medical	...	...	6	11	17
Civil Engineering	21	18	19	21	79
Electrical Engineering	9	10	13	9	41
Mining Engineering	1	...	2	3	6
Mechanical Engineering	8	10	9	30	57
Chemical Engineering	...	1	10	11	22
Engineering	...	...	...	13	13
Chemical	6	14	9	14	43
Specials	...	...	4	5	9
Totals	105	125	156	244	634

INDEX

ABSENCES from classes........... 96
ADDRESSES of students 117–134
ADMINISTRATION
  Building.................... 92
  Officers of.................. 12
ADMISSION, Requirements for, by
  certificate................... 15
  College Entrance Examination
    Board..................... 16
  Examinations for............. 16
  Requirements in
    English.................... 17
    French..................... 20
    German.................... 21
    Greek...................... 20
    History.................... 19
    Latin...................... 20
    Mathematics............... 19
    Physics.................... 21
ALUMNI
  Associations................. 114
  Officers...................... 14
  Trustees..................... 6
ASTRONOMY, courses in.......... 66
  Observatory.................. 92
ATHLETICS..................... 106
ATTENDANCE................... 96
BEQUEST, Form of............ cover
BIBLE, Courses in.............. 46
BIOLOGY, Courses in............ 58
  Laboratory................... 92
BOTANY, Courses in............ 58
BRAINERD HALL................ 93
BUILDINGS.................... 91
CALENDAR for College Year..... 3
CERTIFICATE, Admission by..... 15
CHAPEL
  Memorial Building........... 93
  Attendance.................. 102
CHEMISTRY, Courses in......... 59
  Laboratory.................. 92
CHEMICAL ENGINEERING
  Curriculum.................. 31
CIVIL ENGINEERING
  Courses..................... 68
  Curriculum.................. 32
COMMITTEES, Faculty........... 11
  Trustees..................... 6
COURSES of Instruction....... 46–82
  Tabular Exhibit of......... 26–35
CURRICULUM................... 22
DEGREES
  Conferred in 1916............ 107
  Requirements for B.A... 22, 23, 26
  Ph.B.................. 22, 23, 27
  B.S................... 22, 23, 28
  B.S. in Chem. Eng......... 22, 31
  in Civil Eng............... 22, 32
  in Elec. Eng............... 22, 33
  in Mech. Eng............... 22, 24
  in Min. Eng................ 22, 35
  B.S. in Chemistry......... 22, 30
Requirements for M.A., M.S... 98
DORMITORIES, Rooms in........ 90
ECONOMICS, Courses in......... 55
ELECTRICAL ENGINEERING
  Courses..................... 75
  Curriculum.................. 33
ENGLISH, Courses in............ 46
EXAMINATIONS
  for admission................ 59
  Semi-annual................. 97
  for Master's Degree.......... 98
EXPENSES..................... 87
  College Fees................. 86
  Board and Room............. 90

FACULTY, List of.............. 8
  Committees.................. 11
FEES.......................... 86
FRENCH, Courses in............ 52
FRESHMAN CLASS, List of....... 127
  Exhibit of Studies............ 26
GAYLEY HALL................... 92
GEOLOGY, Courses in........... 63
GERMAN, Courses in............ 53
GOVERNMENT, Courses in....... 56
GRADES........................ 97
GRADUATE STUDENTS
  Candidates.................. 117
  Requirements................ 98
GRADUATION
  Requirements for............ 98
GRAPHICS, Courses in.......... 63
GREEK, Courses in............. 48
GROUPS of Studies............. 23
GYMNASIUM..................... 92
HISTORICAL SKETCH OF COLLEGE. 13
HISTORY, Courses in........... 56
HONORS........................ 24
  awarded at Commencement, 1916..................... 109
HYGIENE, Course in............ 85
INFIRMARY..................... 93
ITALIAN, Courses in........... 54
JUNIOR CLASS, List of......... 120
LABORATORY FEES............... 86
LATIN, Courses in............. 51
LIBRARY....................... 94
MAP................Frontispiece
MARCH FIELD................... 92
MATHEMATICS, Courses in....... 65
MECHANICAL ENGINEERING..... 77
  Curriculum.................. 34
MUSEUM........................ 96
MINING ENGINEERING
  Courses..................... 83
  Curriculum.................. 35
OBSERVATORY................... 92
OFFICERS
  of Administration........... 12
  of Instruction.............. 8
  Alumni...................... 114
PARDEE HALL................... 96
PARDEE SCIENTIFIC DEPT.... 13, 58
PHI BETA KAPPA................ 104
PHILOSOPHY, Courses in........ 57
PHYSICAL TRAINING............. 84
PHYSIOLOGY, Courses in........ 58
PHYSICS, Courses in........... 67
  Laboratory.................. 91
POLITICAL SCIENCE............. 56
PREACHERS to the College...... 103
PRIZES........................ 99
PSYCHOLOGY, Courses in........ 57
PUBLIC LECTURES............... 104
PUBLICATIONS.................. 106
REGISTRATION.................. 15
RELIGIOUS INSTRUCTION......... 102
ROOMS, College................ 90
SCHEDULES of Recitations..... 36–45
SCHOLARSHIPS.................. 88
SENIOR CLASS, List of......... 117
SOCIETIES..................... 104
SOPHOMORE CLASS, List of...... 123
SPANISH, Courses in........... 54
STUDENTS, by Classes.......... 117
  Candidates for M.A.......... 117
  Summary by Classes.......... 134
  Summary by States........... 134
STUDIES, Tabular Exhibit of..... 26
SYNOD......................... 14
TERMS AND VACATIONS........... 98
TIME SCHEDULES............ 36–45
TRUSTEES, List of............. 8
  Committees.................. 9
TUITION....................... 86
VAN WICKLE LIBRARY............ 92
YOUNG MEN'S CHRISTIAN ASSOCIATION..................... 104

BEQUESTS AND DEVISES

Each state has special statutory regulation in regard to wills, and it is most important that all testamentary papers be signed, witnessed, and executed in all other respects according to the laws of the state in which the testator resides. In all cases, however, the name of the corporation must be accurately given, as in the following forms:

I give, devise, and bequeath to "Lafayette College," in Easton, Pennsylvania, its successors and assigns forever, the sum of ....dollars, to be invested by said corporation in good security, and the interest accruing therefrom to be applied to the support of the Professors in said College.

I give, devise, and bequeath a certain lot situated, etc., to "Lafayette College," in Easton, Pennsylvania, and to their successors and assigns forever, for the uses and purposes of said College, according to the provisions of its charter.

Charitable bequests are void in Pennsylvania unless made thirty days prior to the death of the testator.

UNIVERSITY OF ILLINOIS-URBANA
3 0112 111997190